JPRS-UCH-84-014

18 December 1984

USSR Report

CHEMISTRY

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Tashkent KHIMIYA PRIRODNYKH SOYEDINENIY in Russian No 4, Jul-Aug 84 (manuscript received 4 Jul 83) pp 495-498

KRISTALLOVICH, E. L., YAGUDAYEV, M. R. and ISRAILOV, I. A., Order of Labor Red Banner Institute of Chemistry of Biological Substances, UzSSR Academy of Sciences, Tashkent

[Abstract] Recent discovery of new aporphine alkaloids with substituents in 1, 2 or 9, 10 positions made it possible to study summary integral intensity of the IR absorption bands in the region 1480-1630 cm^{-1} and to compare these findings with UV spectral data. The integral intensity of remerine, nontenine and domesticine was lower than that of glaucine, leading to a conclusion that in aporphines with unsubstituted 11-position, the $-O-CH_2-O-$ groups lead to lower $_{\Sigma}A$ because of its non-planarity with the nucleus A. Comparison of $_{\Sigma}A$ with the UV spectra showed that an increase in the rotation angle Q between A and D rings of the diphenyl system of 11-substituted aporphine alkaloids is a result of the steric effect of the methylenedihydroxy group. This angle decreases in the following order: bulbocarpine>isocoridine, coridine>isobetaine.
References 7: 1 Russian, 6 Western.
[13-7813]

UDC 547.944/945

STRUCTURE OF STENANZIDININE

Tashkent KHIMIYA PRIRODNYKH SOYEDINENIY in Russian No 4, Jul-Aug 84 (manuscript received 12 Jul 83) pp 498-500

SAMIKOV, K., SHAKIROV, R. and YUNUSOV, S. Yu., Order of Labor Red Banner Institute of Chemistry of Biological Substances, UzSSR Academy of Sciences, Tashkent

[Abstract] An attempt was made to determine the structure of stenanzidinine (I), m.p. 215-217°C, isolated from Rhinopetalum stenantherum Regel. Mass-spectrometric breakdown of I occurred analogously to that of petylidene.

Reaction of I with acetic anhydride gave diacetyl-I, while oxidation with chromic anhydride yielded stenanzidininedione, m.p. 173-174°C. Analysis of PMR and IR spectra along with mass spectroscopic data led the authors to conclude that I is an isomer of petylidene, differing from it only by the C/D or D/E ring junction. References 6: 3 Russian, 3 Western.
[13-7813]

UDC 534.943

SOME DERIVATIVES OF PAPAVERINE

Tashkent KHIMIYA PRIRODNYKH SOYEDINENIY in Russian No 4, Jul-Aug 84 (manuscript received 21 Jul 83) pp 500-502

DEGTYAREV, V. A., SADYKOV, YU. D., KURBANOV, M. and AKSENOV, V. S., Institute of Chemistry imeni V. I. Nikitin, Ta SSR Academy of Sciences, Dushanbe

[Abstract] In an attempt to synthesize new physiologically active papaverine (I) derivatives, I was reacted with mono- and trichloroacetic acid, chloral hydrate (II) and benzyl chloride (III). Analysis of the products showed that, depending on the chlorine containing agent, two different types of products were obtained. Reactions with chloroacids under mild conditions gave salts. Reactions With II and III yielded 15-(α-hydroxy-β-trichloroacetyl)papaverine and 15-benzoylpapaverine. References 5 (Russian, 2 by Western authors).
[13-7813]

UDC 542.3

PIEZOELECTRIC DETERMINATION METHOD FOR IMPURITIES IN LIQUIDS

Moscow ZHURNAL ANALITICHESKOY KHIMII in Russian Vol 39, No 9, Sep 84 (manuscript received 23 Aug 83) pp 1614-1620

BEL'KOV, V. M. and MALINOVSKAYA, L. M., Moscow Institute of Steel and Alloys

[Abstract] High sensitivity of piezoelectric microbalances (PM) towards foreign materials (10^{-12} g/cm^2) made it possible to use PM in determining the amount of dry residues in liquids. Theoretical discussion of this method led to the development of a formula on the basis of which it was possible to determine the weight of dry residues from the shift in the electrode vibrational frequency. The other aspects covered in this paper included discussion of a priori errors, the range of applicability of PM, maximum detection levels and experimental verification of this method. The greatest systematic error was due to lack of superposition of piezocrystal electrode center and lacuna. The limits of detection were related to the stability of the vibrational frequency of the resonator. In practical experiments it was shown that lyophobic covering with a lacuna in the center of the electrode made it possible to determine the dry residue mass from the shift in the electrode vibrational frequency of the piezoelement. Figures 3; references 6: 4 Russian, 2 Western. [18-7813]

UDC 543.4:547.253.1

EXTRACTION-PHOTOMETRIC DETERMINATION OF POTASSIUM IN DRILLING WATER

Moscow ZHURNAL ANALITICHESKOY KHIMII in Russian Vol 39, No 9, Sep 84 (manuscript received 16 Nov 83) pp 1621-1624

SHABANOV, A. L., BABAYEV, G. A., YELCHIYEV, A. B. and MAMEDOVA, Yu. G., Azerbaijan Institute of Petroleum and Chemistry, Baku

[Abstract] A method was developed for determination of potassium in presence of relatively large amounts of sodium and alkaline earth metals based on selective complexing of potassium with dimethyldibenzo-18-crown-6 (I) followed by extraction of the ionic associate of I with picrate ion. The Na, Ca, Ba and Mg ions did not interfere with this determination up to the concentration

of 0.6 M. Five specimens of drilling waters from Neftechalinsk and Khillinsk deposits were analyzed by the proposed method and by flame photometry; the results were comparable. Figures 3; references 9: 3 Russian, 6 Western. [18-7813]

UDC 543.423:546.289

ATOMIC EMISSION SPECTROCHEMICAL ANALYSIS OF ULTRAPURE GERMANIUM WITH PRECONCENTRATION OF IMPURITIES BASED ON VAPOR PHASE AUTOCLAVE SAMPLE DECOMPOSITION IN ELECTRODE

Moscow ZHURNAL ANALITICHESKOY KHIMII in Russian Vol 39, No 9, Sep 84 (manuscript received 27 Sep 83) pp 1636-1640

PIMENOV, V. G., PRONCHATOV, A. N., MAKSIMOV, G. A., SHISHOV, V. N., SHCHEPLYAGIN, Ye. M. and KRASNOVA, S. G., Institute of Chemistry, USSR Academy of Sciences, Gorkiy

[Abstract] To avoid some of the complicating factors in atomic emission spectrochemical analysis of germanium, autoclave vapor phase decomposition of the test sample was used directly in graphite electrode wells. The purity of acids used in this method showed no effect on the end results. Within the sensitivity of this assay, surface impurities which could have contaminated the analytical specimens during the preparatory steps did not interfere with the analysis. The sensitivity of this method is in the range of 10^{-6} to 10^{-8}%, relative standard deviation -- 0.4. The signal of blank analytical sample was a function of the purity of electrodes used in spectral analysis; it was found that residual impurities of the order of 10^{-4} g are present in all electrodes. Figure 1; references 8: 7 Russian, 1 Western. [18-7813]

UDC 543.88:543.544.8

USE OF KIZHNER'S REACTION FOR CHROMATOGRAPHIC DETERMINATION OF C_3-C_4 CARBONYL SUBSTANCES IN AIR OF INDUSTRIAL SITES

Moscow ZHURNAL ANALITICHESKOY KHIMII in Russian Vol 39, No 9, Sep 84 (manuscript received 12 Jul 83) pp 1674-1678

STOLYAROV, B. V., NAGIMULLINA, A. G. and KARTSOVA, L. A., Leningrad State University imeni A. A. Zhdanov

[Abstract] A simple, rapid and reliable method was proposed for determination of C_3-C_4 carbonyl compounds (aldehydes and ketones) in production zone atmosphere. The method was based on passing the sample being analyzed through hydrazine followed by decomposition of the hydrazones formed on a chromatographic reactor-column to corresponding hydrocarbons according to Kizhner.

This widely used reaction in organic synthetic chemistry was never applied in analysis. The sensitivity of this method is 4-5 μg/l with a relative standard deviation of about 0.15. The shortcomings of this method consist of the inability to determine formaldehyde and acetaldehyde as well as the inability to differentiate between aldehydes and ketones with the same number of carbon atoms. Figures 2; references 17: 14 Russian (1 by Western author), 3 Western.
[18-7813]

UDC 543.544.08

MODIFIED THERMOIONIC DETECTOR IN WHICH CARBON MONOXIDE IS USED AS FLAMMABLE AGENT

Moscow ZHURNAL ANALITICHESKOY KHIMII in Russian Vol 39, No 9, Sep 84 (manuscript received 17 Nov 83) pp 1665-1673

TSITSISHVILI, G. V., BEREZKIN, V. G., ANDRONIKASHVILI, T. G. and GVELESIANI, Z. A., Institute of Physical and Organic Chemistry imeni P. G. Melikishvili, GSSR Academy of Sciences, Tbilisi

[Abstract] Routinely, thermoionic detectors use hydrogen as the flammable agent. Utilization of carbon monoxide instead of hydrogen makes it possible to use the detector even at low temperatures because formation of water (when H_2 is used) is avoided. This in turn slows down the detector corrosion and loss of current. Optimal operational conditions for the carbon monoxide source used as a flammable agent in modified thermoionic detector can be achieved with the following gas flow: 40-45 ml/m of carbon monoxide, 30 ml/m of nitrogen and 400-450 ml/m of air; the interelectrode gap should be 5-7 mm and the diameter of jet burner 1.8-2 mm. Using this carbon monoxide source increased 2-4 fold the sensitivity of thermoionic detector towards nitrogen-containing substances. Figures 5; references 32: 9 Russian (1 by Western authors), 23 Western (2 by Russian authors).
[18-7813]

UDC 543.253:66.092:677.04

POLAROGRAPHIC STUDIES ON RONGALITE DECOMPOSITION IN AQUEOUS SOLUTIONS

Moscow ZHURNAL NEORGANICHESKOY KHIMII in Russian Vol 29, No 10, Oct 84 (manuscript received 21 Apr 83) pp 2456-2460

MAKAROV, S. V., POLENOV, Yu. V. and BUDANOV, V. V., Ivanovo Institute of Chemical Technology

[Abstract] Polarographic studies were conducted on the course of decomposition of rongalite (formaldehyde sodium sulfoxylate) in aqueous solution at pH 1.81-6.80 under argon. After an induction period, rapid decomposition set in. Within 50-60 min of the start, i.e., after the induction period, active sulfur

(S_a) appears (elementary sulfur, and sulfur in HSOH, polysulfide chain, etc.), increases to a constant value and only slightly decreases at the end of the process. Sulfite concentration reaches a maximum in the rapid phase, then virtually disappears. Sulfide appears after sulfite but before S_a, and its concentration pattern mimics that of S_a. Thiosulfate was not detected. The existence of a latent period and a symbatic relationship between the rate of decomposition and S_a concentration suggest an autocatalytic process enhanced by S_a. The autocatalytic nature of decomposition was confirmed by various additives ($Na_2S_2O_3$, Na_2S, Na_2SO_3, CH_2O, $HOCH_2SO_3Na$) that influenced the rate of decomposition. The enhancement of inhibition of the process was related to dithionate ($S_2O_4^{2-}$) concentration, pointing to the key role of this ion in the generation of S_a and the course of the reaction. Figures 3; references 12: 1 Czech, 10 Russian, 1 Western.
[37-12172]

UDC 547.964.4

NATURAL PEPTIDES AND THEIR ANALOGS, PART 32: SYNTHESIS AND PROPERTIES OF RETRO-LEUCINE-5-ENKEPHALINE

Leningrad ZHURNAL OBSHCHEY KHIMII in Russian Vol 54, No 8, Aug 84
(manuscript received 5 May 83) pp 1907-1911

SHVACHKIN, Yu. P., SHISHKINA, A. A., SMIRNOVA, A. P., FEDOTOV, V. P., IVANENKO, T. I., BUSHUYEVA, G. I. and BATRAMEYEVA, L. A., Institute of Experimental Endocrinology and Chemistry of Hormones, USSR Academy of Medical Sciences, Moscow

[Abstract] Recently, a new group of peptide regulators having an affinity for opiate receptors was isolated from animal brain. A typical opiate receptor, named leucine-5-enkephaline, is a pentapeptide with all asymmetric amino acid groups belonging to the steric L-series. To study the structural-functional organization of leucine-5-enkephaline, retro-leucine-5-enkephaline, an isomer of natural neuropeptide differing from it by having an opposite direction of all peptide bonds between the amino acid groups entering the peptide molecule was synthesized for the first time. Subcutaneous administration of the compound to rats stimulated prolactin secretion. References 7: 3 Russian, 4 Western.
[23-12765]

UDC 541.128

CATALYTIC ACTIVITY OF NICKEL-CHROMIUM CATALYST IN DEHYDROGENATION OF ISOPROPYL ALCOHOL

Minsk IZVESTIYA AKADEMII NAUK BSSR: SERIYA KHIMICHESKIKH NAUK in Russian No 4, Jul-Aug 84 (manuscript received 5 Jan 84) pp 17-22

YERMOLENKO, Ye. N., YEROFEYEV, B. V., GERASIMOVA, L. V. and BELOUSOVA, R. A., Institute of Physical-Organic Chemistry, Belorussian SSR Academy of Sciences

[Abstract] A study was made of the change in structure and catalytic properties as a function of the composition of nickel-chromium catalysts in dehydrogenation of isopropyl alcohol. This work is a continuation of work performed by the authors on the influence of conditions of preparation of nickel-chromium catalysts on their adsorption properties and phase composition. The ratio of nickel to chromium was varied from 5:95 to 84:16. Specimens were prepared by joint precipitation of nickel hydroxide and chromium hydroxide from a solution of their nitrates, calcination at 400°C, reduction in hydrogen and alternate oxidation at 350°C for 3 hours. It was found that neither of the oxides alone is very active, whereas the presence of a small quantity of either with the other causes activity to rise sharply. Apparently, within Cr_2O_3 concentrations of 5 to 84%, the catalyst is a two-phase $NiO+NiCr_2O_4$ or $Cr_2O_3+NiCr_2O_4$ system. Increasing the quantity of the free chromium or nickel oxide in the catalyst is not accompanied by a significant reduction in degree of conversion. Figures 3; references 12: 9 Russian, 3 Western. [378-6508]

UDC 665.664.4

REFORMING BENZINE FRACTION ON POLYMETALLIC CATALYST

Minsk IZVESTIYA AKADEMII NAUK BSSR: SERIYA KHIMICHESKIKH NAUK in Russian No 4, Jul-Aug 84 (manuscript received 8 Jul 83) pp 112-116

SEN'KOV, G. M., PUSHKAREV, V. P., KOZLOV, N. S., GUTKOVICH, F. Ye. and ZHIZHENKO, G. A., Institute of Physical-Organic Chemistry, Belorussian SSR Academy of Sciences

[Abstract] This work continues a study of the specifics of operation and regeneration of a polymetallic catalyst in reforming of a wide gasoline fraction on an industrial installation with a capacity of one million tons raw

material per year. The catalyst operated for 29 months and is still in use, with a specific productivity of 30.1 tons raw material per kg. The polymetallic catalyst KR-104 has experienced the same changes in chemical composition as occur for monometallic AP-56 and AP-64 catalysts. Sulfur and iron deposits accumulate on the surface. The dispersion of the platinum base has not changed during the 29 months of operation. Figures 3; references 9: 8 Russian, 1 Western.
[378-6508]

UDC 541.183:543.5:66.081

STUDY OF CARBON CATALYSTS BY METHODS OF X-RAY PHOTOELECTRON SPECTROSCOPY AND THERMAL ANALYSIS

Kiev TEORETICHESKAYA I EKSPERIMENTAL'NAYA KHIMIYA in Russian Vol 20, No 9, Jul-Aug 84 (manuscript received 25 Apr 83) pp 496-501

LARINA, A. A., TARKOVSKAYA, I. A., ZAKOLODYAZHNAYA, O. V., SHEPELIN, A. P., and ZHDAN, P. A., Physico-Chemical Institute, UkSSR Academy of Sciences, Odessa; Institute of Physical Chemistry imeni L. V. Pisarzhevskiy UkSSR Academy of Sciences, Kiev

[Abstract] X-ray photoelectron spectroscopy and thermogravimetry were used to study carbon catalysts with different kinds of surface. Individual types of oxygen-containing could not be identified by these methods because many types of functional groups with closely related energy states exist on the oxidized carbon surface. Changes on the thermograms of various samples of carbons correlate well with other data concerning the nature of the surface of oxidized and unoxidized carbons with results of determination of their catalytic activity. The degree of oxidation of carbons and prediction of their catalytic activity in proteolytic reactions may be judged by the intensity of peaks and points of both exothermic and endothermic maxima. Figures 3; references 20: 10 Russian, 10 Western.
[5-2791]

UDC 661.53.094.373

OXIDATION OF AMMONIA OVER NONPLATINUM CATALYST

Moscow KHIMICHESKAYA PROMYSHLENNOST' in Russian No 9, Sep 84 pp 540-542

NAZAROVA, T. I., ZAVIDKOVA, G. N., BEZRUCHKO, B. N. and MATROSOVA, M. I.

[Abstract] Results were reported of experimental oxidation of ammonia to nitrogen oxide (II) over a catalyst consisting of iron oxide and bismuth with thermally-stable additive, evaluated over a wide range of technological parameters. The yield of nitrogen oxide (II) was a function of the temperature, time of contact with the catalyst, content of ammonia in air-ammonia mixture (AAM) and the grain size of the catalyst used. It was concluded that the

dependence of nitrogen oxide (II) yield on the time of contact with non-platinum catalyst is analogous to its dependence observed with platinized catalysts. The rate of ammonia oxidation on non-platinum catalysts was lower by two orders of magnitude. The yield of nitrogen oxide (II) was determined by the temperature of the process and the ratio of oxygen to ammonia in the AAM. Figures 3; references 9: 8 Russian, 1 Western.
[16-7813]

UDC 541.128.12:542.943:547.269

CATALYST COMPLEX FOR DEMERCAPTANIZATION OF LIGHT HYDROCARBON CRUDE

Moscow KHIMIYA I TEKHNOLOGIYA TOPLIV I MASEL in Russian No 9, Sep 84 pp 14-15

FOMIN, V. A., KOMLEVA, T. I., IZMAYLOVA, N. R. and ZAYNULLIN, R. A., All-Union Scientific Research Institute of Construction Administration, Kuybyshev Petroleum Processing Plant

[Abstract] Comparative studies of catalytic activity of cobalt polyphthalocyanin and cobalt disulfophthalocyanin during oxidation of various mercaptides under uniform conditions indicated the most effective catalytic systems for demercaptanization of light hydrocarbon crude. The study showed the superiority of a new catalytic complex consisting of an alkaline solution of cobalt disulfophthalocyanin and 0.5-4 percent by volume diethylene glycol or triethylene glycol for use in demercaptanization devices. Industrial tests confirmed the superiority of this new complex. References 4 (Russian).
[8-2791]

UDC 665.644.442

INFLUENCE OF REFORMING REGIMEN ON CATALYST DEACTIVATION RATE

Moscow KHIMIYA I TEKHNOLOGIYA TOPLIV I MASEL in Russian No 9, Sep 84 pp 15-17

FEDOROV, A. P., SHKURATOVA, Ye. A., MASLYANSKIY, G. N. and ZHARKOV, B. B., Lenneftekhim Scientific Production Association

[Abstract] Effect of basic technological parameters of the reforming process (rigidity), determined by the octane number of the reformant obtained, the pressure and molar water/crude ratio on the rate of deactivation of polymetallic catalyst KR-108 was studied on a pilot device operating under pressure with circulation of water-containing gas adsorbed by drying the raw material and circulating gas. Quantitative dependencies reflecting the effect of basic parameters of reforming on the rate of deactivation, found for KR-108, may be used to determine qualitative relationships of other platinum reforming catalysts. They facilitate accurate selection of optimal conditions of operation of reforming catalysts and make it possible to select the range of change of technological parameters of the process during design of new catalytic reforming devices. Figures 4; references 9: 4 Russian, 5 Western.
[8-2791]

UDC 665.644.446:665.666.4

INCREASE OF EFFECTIVENESS OF REFORMING OVER AP-56 CATALYST

Moscow KHIMIYA I TEKHNOLOGIYA TOPLIV I MASEL in Russian No 9, Sep 84 pp 40-42

CHIZHOV, V. B., RABINOVICH, G. L., SHIPIKIN, V. V. and EPPEL', S. A., Production Association "Angarsknefteorgsintez"; Scientific Production Association "Lenneftekhim"

[Abstract] Attempts to improve technical and economic indices of reforming during xylene production at the Angarsknefteorgsintez Production Association included comparison of the process of reforming with the use of aluminum platinum catalyst AP-56 under conditions resembling industrial conditions without removing hydrogen sulfide from the gas-product mixture and with adsorption purification of it with use of GIAP-10 contact, consisting of pelletized zinc oxide. Results of reforming by these methods at 475°C and results of study of stability of operation of catalyst AP-56 for 1000 hours at a temperature which ensures a 60 percent (weight) level of aromatic hydrocarbons in the stable reformant are presented and discussed. The low cost and availability of contact GIAP-10 makes the use of the adsorption purification method more economical than the use of monoethanolamine purification of the circulation gas. Figure 1; references 8 (Russian).
[8-2791]

UDC 546.224:542.943:542.973

SPHEROIDAL VANADIUM CATALYSTS IN PROCESSING DUST-LADEN HIGH-SO_2 GAS

Ivanovo IZVESTIYA VYSSHIKH UCHEBNYKH ZAVEDENIY: KHIMIYA I KHIMICHESKAYA TEKHNOLOGIYA in Russian Vol 27, No 8, Aug 84 (manuscript received 4 Oct 82) pp 939-942

LARIONOV, A. M., PETUKHOVA, T. S., KABANOV, A. N. and DROZDOVSKIY, V. Ya., Chair of Catalyst Technology, Leningrad Technologic Institute imeni Lensovet; Voskresensk Production Association "MINUDOBRENIYA"

[Abstract] Experimental studies were conducted on the effectiveness of amorphous aluminosilicate, and aluminosilicates reinforced with asbestos or zeolite as carriers for spherical vanadium catalysts. Use of the carriers increased the content of granular catalyst in the preparation from 65% to 80-95%. Trials simulating industrial conditions in the oxidation of SO_2 in gases containing 0.07-0.09 g/m^3 of 3.8 mcm dust particles yielded conversions of 64-70% at entrance temperatures of 400-460°C. Trials at 485°C showed that activity of the catalysts fell by 2-5% due to structural alterations and chemical changes in the catalysts. The decrease in the concentration of potassium and vanadium oxides was proportional to the increase in the degree of granule sulfatization. Figures 3; references 6 (Russian).
[17-12172]

UDC 547.536.22:66.094.18

DEHYDROGENATION OF p-DIETHYLBENZENE: COMPARATIVE ASSESSMENT OF CATALYSTS

Ivanovo IZVESTIYA VYSSHIKH UCHEBNYKH ZAVEDENIY: KHIMIYA I KHIMICHESKAYA TEKHNOLOGIYA in Russian Vol 27, No 8, Aug 84 (manuscript received 4 Aug 82) pp 915-919

ROZHKOV, V. I., LEBEDEV, N. N., ODABASHYAN, G. V. and ZAYDMAN, O. A., Chair of Technology of Basic Organic and Petrochemical Synthesis, Moscow Institute of Chemical Technology imeni D. I. Mendeleyev

[Abstract] Several commercially available oxides (KMS-1, KS-4, KS-6, K-22, K-24M) were tested for their catalytic effectiveness in dehydrogenation of p-diethylbenzene (PDEB). Dehydrogenation at 560°C, using catalyst granules 2x3 mm in size, resulted in the following products identified by chromatography: ethylstyrene, divinylbenzene, benzene, toluene, ethylbenzene, styrene, ethyltoluene, and methylstyrene. In terms of activity, KS-4 and K-22 exceeded the other catalysts with 62.3 and 54.1% conversion under optimal conditions, respectively. The corresponding conversion values of K-22M, KMS-1, and KS-6 were 52.1%, 51.3%, and 50.7%, respectively. It is evident then, that KS-4 and K-22 are the catalysts of choice for the production of ethylstyrene and divinylbenzene. Figures 4; references 4 (Russian).
[17-12172]

UDC 547.314.315.1.2

INTERPHASE CATALYSIS IN ALKYNE AND DIENE SYNTHESIS

Ivanovo IZVESTIYA VYSSHIKH UCHEBNYKH ZAVEDENIY: KHIMIYA I KHIMICHESKAYA TEKHNOLOGIYA in Russian Vol 27, No 8, Aug 84 (manuscript received 23 Feb 82) pp 890-895

GUSEYNOVA, T. M. and ALESKEROV, M. A., Chair of Organic Chemistry, Azerbaijan Institute of Petroleum and Chemistry imeni M. Azizbekov

[Abstract] Experimental details are presented on the synthesis of alkynes and dienes by alkaline dehydrohalogenation of alkane dihalides and alkene halides in a two-phase system. Using aromatic hydrocarbons, alkyl aromatics or ethers as solvents and dibenzo-18-crown-6 or 18-crown-6 ethers as catalysts equal to 0.5-2 mol % of the 1.5-2-fold excess of dry KOH at 135°C, resulted in the exothermic removal of one hydrogen halide molecule from all the 1,2-dihalides tested. The resultant alkene halides consisted of three isomeric forms (2-haloalkene-1, cis-1-haloalkene-1, trans-1-haloalkene-1). Subsequently, 2-haloalkene-1 and cis-1 haloalkene-1 (61-70% of the total alkene halides formed) underwent rapid conversion into alkyne-1 (5-10 min in the case of bromides). Transformation of trans-1-haloalkene-1 into alkyne-1 requires significantly longer periods of time. References 12: 5 Russian, 7 Western.
[17-12172]

UDC 541.124:539.196

BRANCHING REACTION RESULTING IN SELF-IGNITION OF RICH METHANE OXYGEN MIXTURES

Kiev TEORETICHESKAYA I EKSPERIMENTAL'NAYA KHIMIYA in Russian Vol 20, No 4, Jul-Aug 84 (manuscript received 5 Dec 80) pp 501-502

MULYAVA, M. P., SHCHEMELEV, G. V. and SHEVCHUK, V. U., Borislav

[Abstract] Description and discussion of the branching reaction leading to self-ignition of a rich methane-oxygen mixture showed it to be the result of interaction of atomic hydrogen and oxygen. References 9: 8 Russian, 1 Western. [5-2791]

UDC 66.063.62:631.89

PRODUCTION INTENSIFICATION OF 10-34-0 BRAND COMPLEX LIQUID FERTILIZERS

Moscow KHIMICHESKAYA PROMYSHLENNOST' in Russian No 9, Sep 84 pp 533-536

KOCHETKOV, V. N., YANKIN, V. M., VINOGRADOVA, V. N. and BARANOV, A. A.

[Abstract] It was shown that lowering the P_2O_5 conversion constant K_c in 10-34-0 complex liquid fertilizers (CLF) from standard 79-80% to 53-55% had practically no effect on the principal properties of solutions: viscosity, density and crystallization temperature. It was also discovered that the production of CLF could be intensified by introduction of orthophosphoric acids (23-54% P_2O_5) or by solutions of ammonium orthophosphate into the process at the stage of ammonium polyphosphate solution. This increased the productivity 1.5 fold without affecting the quality of CLF. Detailed parameters of this technological process and equipment diagrams were reported. Since salt formation was still a problem, a special tubular reactor was designed which could be easily adapted to existing plant equipment. Figures 2; references 8 (Russian).
[16-7813]

UDC 665.335.9.094.1

LOW TEMPERATURE TRANSESTERIFICATION USING BIOCATALYSTS

Tashkent UZBEKSKIY KHIMICHESKIY ZHURNAL in Russian No 4, Jul-Aug 84 (manuscript received 19 Mar 82) pp 39-41

KADYROVA, Z. Kh., RAKHIMOV, M. M. and ABDURAKHIMOV, A., Central Asian Scientific Research Institute of PKI [expansion unknown] Food Industry

[Abstract] Data are reported supporting the possibility of using lipase for production of transesterified fatty bases. The experiments were carried out on stearine and cotton oil. The degree of esterification depended on the temperature and varied from lipase to lipase. The highest activity of the enzyme was found at about 50°C in absence of water. It was shown that lipases are capable of hydrolysing lipids and, in select cases, of accelerating transesterification. As a result of the transesterification, the melting point and the hardness of the fatty base obtained was lowered. The fats thus obtained could be used in production of margarine. Figures 2; references 7: 6 Russian, 1 Western.
[12-7813]

UDC 661.183

INDUSTRIAL TRIAL OF PRODUCTION METHOD FOR GRAPE JUICE USING H-CATIONIZATION IN ELECTROMAGNETIC FIELD

Tashkent UZBEKSKIY KHIMICHESKIY ZHURNAL in Russian No 4, Jul-Aug 84 (manuscript received 20 Jul 83) pp 49-51

RIZAYEV, N. U., SADYKOV, A. M., SHAGIAKHMEDOVA, R. and UBAYDULLAYEV, Sh., Tashkent Textile Institute

[Abstract] Stabilization of grape juice by H-cationization in a magnetic field is highly effective. A technological process was developed for this operation and optimal parameters were established for a pilot plant. Two months after the processing of the juice, its properties remained excellent. The process could be fully automated, leading to a continuous operation. Figure 1.
[12-7813]

UDC 547.572.1+542.944.2

FREE RADICAL CHLORINATION OF ACETALS AND ORTHOETHERS

Leningrad ZHURNAL ORGANICHESKOY KHIMII in Russian Vol 20, No 8, Aug 84 (manuscript received 14 Feb 83) pp 1645-1647

ROL'NIK. L. Z., PASTUSHENKO, Ye. V., ZLOTSKIY, S. S. and RAKHMANKULOV, D. L.

[Abstract] Iodobenzene chloride and sulfuryl chloride were used to chlorinate 1,3-dioxolane and the orthoethers trihexoxymethane and 2-hexoxy-1,3-dioxolane in benzene solutions at 55 C in the presence of azo-bis-isobutyronitrile. Regardless of the chlorinating agent, these reactions yielded respectively 2-chloroethyl formate; a mixture of dihexyl carbonate and hexyl chloride; and a mixture of ethylene carbonate, 2-chloroethyl formate, and hexylchloride. This indicates removal of hydrogen by a solvated chlorine atom. Apparently, free radicals remove a hydrogen from the most highly substituted carbon atom, forming an intermediate polyalkoxyalkyl free radical which in turn accepts a chlorine atom and then decomposes into the final products with the breaking of only exocyclic C-O bonds. References 5: 4 Russian, 1 Western.
[25-12672]

UDC 543.422.8

X-RAY ELECTRON ANALYSIS OF SURFACE OF CHALCOGENIDE SEMICONDUCTING FILMS WITH $As_x Se_{1-x}$ COMPOSITION

Moscow POVERKHNOST': FIZIKA, KHIMIYA, MEKHANIKA in Russian No 9, Sep 84 (manuscript received 6 Apr 83) pp 45-49

LARIN, N. V., YEREMIN, A. I. and ULEVATYY, B. Ye., Institute of Chemistry, USSR Academy of Sciences, Gorkiy

[Abstract] Results of X-ray electron microscopic study of 1-10 μm thick chalcogenide vitreous semiconducting $As_x Se_{1-x}$ films produced by deposition of the components on a backing of glass ceramics and gallium arsenide were presented. X-ray 3d lines of As, Se and valent zones were studied. Decomposition of the mixture of hydrides of arsenic and selenium in a high-frequency discharge produced amorphous films of arsenic-selenide glass. The charge potential of the sample surfaces increased with an increase of selenium concentration because of the increase of the width of the forbidden band in the semiconducting films with a high selenium level. Change of composition of samples in the X-ray electron spectra produced noticeable chemical shifts of 3-d lines of arsenic and selenium. The position of these lines is due to changes of the quantitative relationship between structural units, forming glass, with a change of As-Se atomic ratio. Figures 4; references 8: 5 Russian, 3 Western.
[7-2791]

UDC 539.216.22

THIN AMORPHOUS SiC:Si FILMS

Moscow POVERKHNOST': FIZIKA, KHIMIYA, MEKHANIKA in Russian No 9, Sep 84 (manuscript received 10 May 83; final draft received 25 Oct 83) pp 58-59

VAKHMYANIN, L. P., MATVEYEV, O. A. and SLADKOVA, V. A., Physico-Technical Institute imeni A. F. Ioffe, USSR Academy of Sciences, Leningrad

[Abstract] Production of thin amorphous SiC:Si films, deposited on a cold substrate by a method resembling reactive cathode sputtering was described and some properties of the film produced were discussed. Experiments were performed on an ion-beam accelerator. A flow of argon ions with 25 keV energy sputtered

a silicon target and a dense amorphous film ranging in thickness from 25 A to 300 A, according to the sputtering regime, was formed on the substrate. The film thickness increased linearly with the increase of the dose of ions. Films of 200 A thickness were very homogeneous and flaw-free but, at 25 A thickness, compactness was disturbed and holes appeared while some sections remained the same without structural defects. Auger spectroscopy showed that the chemical composition of the film did not depend on the production regime nor film thickness. Silicon carbide lines and a peak of free silicon (20 percent) throughout the film were accompanied by traces of Cd, Fe, Ni, S, Cl and others). The mechanism of film formation was discussed. Figures 2; references 3: 2 Russian, 1 Western.
[7-2791]

UDC 541.128

PHASE COMPOSITION AND PROPERTIES OF COMPLEX Ni-Co-M-O OXIDES

Ivanovo IZVESTIYA VYSSHIKH UCHEBNYKH ZAVEDENIY: KHIMIYA I KHIMICHESKAYA TEKHNOLOGIYA in Russian Vol 27, No 8, Aug 84 (manuscript received 13 Dec 82) pp 875-879

MARKINA, E. L. and POLISHCHUK, V. Ye., Chair of Physical Chemistry, Odessa State University imeni I. I. Mechnikov

[Abstract] Description is provided of the synthesis of $Ni_{1.0}$-C_{2-x}-M_x-O oxide systems, and x-ray diffractometric analysis of the phase composition when M = Mn, Cr, Fe, or Ti, and x varies from 0.1 to 1.0 at 0.1 unit intervals. The oxides were prepared by coprecipitation of the respective hydroxides by ammonium hydroxide at pH 8 and 343 °K, and subsequent heating in the 473-1273 °K, and subsequent heating in the 473-1273 °K range at 200 °K intervals. Diffractometric studies showed that, as the temperature increased, the width of the peaks narrowed, indicating improved crystallinity, showing that partial replacement of Co in the $NiCo_2O_4$ system alters the crystalline lattice. Evaluation of the catalytic activity of the various compounds in hydrogen peroxide decomposition, showed that compounds possessing 25-35% manganese evidenced the highest levels of activity. In all cases, except in the partial replacement of Co by Ti, partial substitution of other metals for Co resulted in increased catalytic activity. Figures 2; references 7: 5 Russian, 2 Western.
[17-12172]

UDC 541.123

PHASE DIAGRAM OF SODIUM-POTASSIUM SYSTEM AT HIGH PRESSURES

Leningrad ZHURNAL OBSHCHEY KHIMII in Russian Vol 54, No 8, Aug 84 (manuscript received 24 Jan 84) pp 1706-1710

MORDKOVICH, V. Z., AVDEYEV, V. V. and SEMENENKO, K. N., Moscow State University imeni M. V. Lomonosov

[Abstract] Low-melting, sodium-potassium alloys are of great interest in chemical engineering, material handling and applied physics. Differential thermal analysis was used for the first time to study phase diagrams of this system at high hydrostatic pressures to 1050 MPa. Formulas are presented for approximating experimental data on the relationship of phase conversion temperature to pressure which are simple and more explicit than the previously-used melting point-pressure expressions. Figures 2; references 14: 4 Russian, 10 Western.
[23-12765]

UDC 546.812'141.07

SYNTHESIS OF REAGENT-GRADE STANNOUS BROMIDE FROM ELEMENTS

Moscow ZHURNAL NEORGANICHESKOY KHIMII in Russian Vol 29, No 10, Oct 84 (manuscript received 21 Apr 83) pp 2461-2463

GOSPODINOV, G. G., Higher Institute of Chemical Technology, Burgas, Bulgaria

[Abstract] Technical details are presented on the synthesis of reagent-grade stannous bromide in a glass reaction vessel ("razoterm"). Time-course data are presented on the reaction carried out in vacuo, which first resulted in the formation of $SnBr_4$, and its subsequent reduction to $SnBr_2$ and sublimation of the product in the same vessel. Complete conversion of $SnBr_4$ into $SnBr_2$ occurs in the presence of excess metallic Sn, equivalent to at least 60% of stoichiometrically-required concentration, and requires about 5 h at 500°C. The purity of the product was confirmed by x-ray analysis and Mossbauer spectroscopy. Figures 4; references 5: 3 Russian, 2 Western.
[37-12172]

UDC 546.3-19'11

REACTION OF BORON-CONTAINING INTERMETALLIC COMPOUNDS WITH HYDROGEN

Moscow ZHURNAL NEORGANICHESKOY KHIMII in Russian Vol 29, No 10, Oct 84 (manuscript received 29 Apr 83) pp 2629-2631

SEMENENKO, K. N., KALINNIKOV, G. V., KRAVCHENKO, O. V., BURNASHEVA, V. V., BILONOZHKO, N. S. and KUZ'MA, Yu. B., Institute of New Chemical Problems, USSR Academy of Sciences

[Abstract] Equilibrium systems were determined for the reaction of hydrogen with the intermetallic compounds YCo_4B (I), $GdCo_4B$ (II) and YCo_3B (III), by analysis of hydrogen desorption isotherms. Evaluation of the isotherms for I-H_2 and II-H_2 at 293-353°K showed that two hydride phases existed at hydrogen pressure to 6×10^6 Pa. An alpha phase with 0.4-0.6 hydrogen atoms per formula unit of the compound, and a dihydride form which dissolved additional hydrogen (up to 0.8 hydrogen atoms) with an increase in hydrogen pressure. The equilibrium hydrogen pressures for alpha phase $\rightleftarrows$ dihydride phase equilibrium ranged from 5.7×10^5 Pa at 293°K to 12.8×10^5 Pa at 353°K for I-H_2, and from 4.6×10^5 to 24.0×10^5 Pa for II-H_2, respectively. The heat and entropy of hydrogen desorption for I-H_2 was calculated at 3.5 and 15.3 kcal/mole, respectively, and 6.0 and 22.8 kcal/mole for II-H_2. The III hydride phase had much lower hydrogen equilibrium pressure, with a desorption pressure of 1.1×10^5 Pa at 293°K. Figures 2; references 6: 1 Ukrainian, 1 Russian, 4 Western. [37-12172]

UDC 621.315.592

MONOCRYSTALS OF SOLID $Tl_{2-x}Cd_xS$ AND $Cd_{1-x}Tl_xS$ ($x < 0.01$) SOLUTIONS

Moscow ZHURNAL NEORGANICHESKOY KHIMII in Russian vol 29, No 10, Oct 84 (manuscript received 30 Jul 83) pp 2708-2709

ASADOV, M. M.

[Abstract] Studies are described on the synthesis of $Tl_{2-x}Cd_xS$ (I) and $Cd_{1-x}Tl_xS$ (II) monocrystals, with the minor component not exceeding 1 atom% concentration. I was synthesized by the Bridgeman method at 730°K at 5 mm/h, and II by a gas transport technique with I_2 carrier. Lack of mutual solubility of the CdS, Tl_2S, Tl and Cd phases was ascribed to the large enthalpy of mixing when the monovalent Tl^+ ions were replaced by the smaller bivalent Cd^{++} cations. The resultant I crystals were dark-blue in color and showed electron-type of conductivity. The electrical resistance of I was increased from 3×10^3 to 5×10^3 Ohm·cm by doping with Cd. The crystals of II were yellowish and difficult to reproduce since the poor solubility of Tl in CdS contributed to chemical heterogeneity. References 4: 3 Russian, 1 Western. [37-12172]

UDC 546.48.654.23

$CdSe-La_2Se_3$ SYSTEM

Moscow ZHURNAL NEORGANICHESKOY KHIMII in Russian Vol 29, No 10, Oct 84 (manuscript received 22 Jul 83) pp 2705-2708

ALIYEV, O. M., AGAYEV, A. B., AZADALIYEV, R. A. and ABDULLAYEVA, M. I., Azerbaijan State University imeni S. M. Kirov

[Abstract] Standard applicable physicochemical methods were employed in an analysis of the $CdSe-La_2Se_3$ system. The system in question was found to be quasibinary with congruently melting $CdLa_2Se_3$ compound with a T_m = 2125°K. The latter represents a third component of the $CdSe-La_2Se_3$ liquidus, with the two extreme components--CdSe and La_2Se_3--corresponding to primary crystallization. The $CdLa_2Se_3$ melts represent a single-phase system with a microhardness that is independent of its composition, and which forms cubic crystal systems of the Th_3P_4-type. Figures 2; references 6: 4 Russian, 2 Western.
[37-12172]

UDC 547.244+547.257.3+547.257.4:541.138

ELECTROCHEMICAL SYNTHESIS OF DICARBOLLYL DERIVATIVES OF COBALT AND NICKEL

Minsk IZVESTIYA AKADEMII NAUK BSSR: SERIYA KHIMICHESKIKH NAUK in Russian No 4, Jul-Aug 84 (manuscript received 19 Mar 84) pp 86-88

ERDMAN, A. A., ZUBREYCHUK, Z. P., SHIROKIY, V. L., MAYER, N. A. and OL'DEKOP, Yu. A., Institute of Physico-Organic Chemistry, Belorussian SSR Academy of Sciences

[Abstract] A study is made of the electrolysis of potassium (3)-1,2-dicarbadodecahydroundecaborate $KC_2B_9H_{12}$ (I) on anodes of cobalt and nickel and it is found that the result is formation of bis-dicarbollyl derivatives of these metals. The only product of electrolysis on a cobalt anode was the derivative bis-(3)-1,2-dicarbollylcobalt (III). The yield depends greatly on current density: increasing current density from 2.5 to 5.0 mA/cm^2 greatly decreases the yield. With a nickel anode, two compounds are produced: the salts bis-(3)-1,2-dicarbollylnickel (III) and neutral bis-(3)-1,2-dicarbollylnickel (IV). Only trace quantities of the corresponding m-dicarbollyl derivatives were formed upon electrolysis on cobalt and nickel anodes. References 7: 5 Russian, 2 Western.
[378-6508]

UDC 541.49+541.124

COMPLEX FORMATION OF NIOBIUM PENTACHLORIDE WITH OXYGEN-CONTAINING DONORS IN ORGANIC SOLVENTS

Leningrad ZHURNAL OBSHCHEY KHIMII in Russian Vol 54, No 8, Aug 84 (manuscript received 1 Aug 83) pp 1684-1689

KUCHERUK, L. V., PALEYEVA, I. Ye., BUCHIKHIN, Ye. P., BRAVERMAN, O. V., GOL'DSHTEYN, I. P. and GUR'YANOVA, Ye. N.

[Abstract] Calorimetric titration was used to study the stoichiometry and thermodynamics of complex formation in reactions of $NbCl_5$ with organic oxygen-containing compounds of sulfur and phosphorus in benzene (inert) and in butyl acetate (donor) solvents. The nature of the coordination bonds in the complexes was studied by dielectrometric and conductometric titration. In the

inert solvent, $NbCl_5$ reacts with oxygen-containing donors to form molecular complexes having one or two donor molecules with coordination numbers of 6 and 7, respectively. In a solvated donor-type solvent such as butyl acetate, complex formation takes place in three stages. First a molecular complex is formed which is followed by the formation of two ionic complexes. Figures 4; references 14: 12 Russian, 2 Western.
[23-12765]

UDC 547.26'118

REACTION OF ESTERS OF HALOGENATED AND DIHALOGENATED NITROACETIC ACIDS WITH TRIPHENYLPHOSPHINE

Leningrad ZHURNAL ORGANICHESKOY KHIMII in Russian Vol 20, No 8, Aug 84 (manuscript received 4 Aug 83) pp 1724-1727

MARTYNOV, I. V., POSTNOVA, L. V., BIKKINEYEV, R. Kh. and YURTANOV, A. I., Institute of Physiologically Active Substances, USSR Academy of Sciences, Chernogolovka

[Abstract] The reaction of six alkyl esters of halogenated nitroacetic acids with triphenylphosphine was studied to assess the possibility of replacing chlorine with hydrogen and the selectivity of halogen reduction. The basic reactions were done in a 1:1 benzene-methanol solution at -10 to +5 C with a 1:1 mole ratio of reactants. The reaction apparently proceeded by formation of a phenyl phosphine complex with subsequent hydrolysis, replacing a chlorine atom with a hydroxyl group. Loss of triphenyl phosphinoxide from the complex then left an intermediate compound which rearranged to yield a nitroacetic acid ester with one less chlorine than the original compound. In addition, the ethyl ester of chloronitroacetic acid, when reacted in benzene at 0-20 C yielded a mix of the nitroacetic acid ester and a cyanoformyl ester (15%). References 7: 2 Russian, 5 Western.
[25-12672]

UDC 542.91+543.422.25+541.67

STUDY OF REACTION OF 2-MONOANYL 1,3-DIPHENYLPROPANETRIONE WITH TRIMETHYLPHOSPHITE

Leningrad ZHURNAL OBSHCHEY KHIMII in Russian Vol 54, No 8, Aug 84 (manuscript received 27 May 83) pp 1733-1737

POLEZHAYEVA, N. A., IL'YASOV, A. V., NAFIKOVA, A. A., ISMAYEV, I. E., YEL'SHINA, Ye. V. and ARBUZOV, B. A., Scientific Research Chemical Institute imeni A. M. Butlerov, Kazan State University imeni V. I. Ul'yanov-Lenin; Institute of Organic and Physical Chemistry imeni A. Ye. Arbuzov, Kazan Branch, USSR Academy of Sciences

[Abstract] Nuclear magnetic resonance spectra show that 2-monoanyl 1,3-diphenylpropanetrione reacts with trimethyl phosphite in the presence of acetic acid to form dimethyl(1-phenyl-2-benzoyl-2-phenyl-aminoethenyl)phosphate.

Dimethyl-(1-hydroxy-1-phenyl-2-benzoyl-2-phenylimino)ethyl-1-phosphonate rearranges in chloroform and dimethylketone into a phosphate. References 4: 2 Russian, 2 Western.
[23-12765]

UDC 543.422.25+541.63+547.879:118

CONFORMATION OF 1,3,2,5-DIOXASILAPHOSPHORINANES WITH TETRA-COORDINATED PHOSPHORUS ATOM

Leningrad ZHURNAL OBSHCHEY KHIMII in Russian Vol 54, No 8, Aug 84 (manuscript received 6 Jul 83) pp 1738-1745

PATSANOVSKIY, I. I., ISHMAYEVA, E. A., STRELKOVA, Ye. N., IL'YASOV, A. V., ZYABLIKOVA, T. A., ISMAYEV, I. E., KUDYAKOV, N. M., VORONKOV, M. G. and PUDOVIK, A. N., Kazan State University imeni V. I. Ul'yanov-Lenin

[Abstract] An on-going study of the spatial structure of the derivatives of a new class of six-membered heterocyclics having a tetra-coordinated phosphorus atom is continued in the present work where dipole moments, the Kerr effect and NMR spectra with H^1, C^{13}, P^{31} and Se^{77} were used to study the conformation of a broader series of dioxasilaphosphorinanes, including new representatives having a selenophosphoryl group. It is shown that when 2,2-dimethyl-5-thiono(seleno)-5-methyl(phenyl)-1,3,2,5-dioxasilaphosphorinanes are in solution, two chair-shaped conformational forms exist, the conformer having an equatorial thio- or selenophosphoryl group being predominant. Figures 3; references 18: 15 Russian, 3 Western.
[23-12765]

UDC 547.241:541.9

SYNTHESIS AND STRUCTURE OF OCTAHEDRAL COMPLEXES OF HALOGENIDES OF TIN, TETRACHLORIDES OF GERMANIUM, TITANIUM AND ZIRCONIUM WITH DIMETHYLPHOSPHONOUS ACID

Leningrad ZHURNAL OBSHCHEY KHIMII in Russian Vol 54, No 8, Aug 84 (manuscript received 17 Jun 83) pp 1745-1749

MURATOVA, A. A., YARKOVA, E. G., MOROZOVA, N. P., SAFIULLINA, N. R. and PUDOVIK, A. N., Kazan State University imeni V. I. Ul'yanov-Lenin

[Abstract] Complexes of dimethylphosphonous acid with stannic tetrabromide and tetrachloride, methyltribromide and chloride, and the tetrachlorides of germanium, titanium and zirconium were prepared by a previous method and studied with IR, PMR and nuclear gamma-resonance spectra. The Group IV elements form the complexes $[(CH_3)_2P(O)H]_2 \cdot (CH_3)_n \cdot (SnX)_{4-n}$ and $[(CH_3)_2P(O)H]_2 \cdot MCl_4$,

where X=Cl, Br, n=0.1 and M=Ge, Ti and Zr. The donor-acceptor bond in these complexes is formed with the unshared pair of electrons in the phosphoryl group. The complexes have a cis-octahedral configuration which is carried over in solution, except for tin and germanium complexes. References 9: 7 Russian, 2 Western.
[23-12765]

UDC 547.26'118/128.7+547.33

REACTIONS OF COMPLETE ESTERS OF HYPOPHOSPHOROUS ACID AND PHENYLPHOSPHONOUS ACIDS WITH AZOMETHINES

Leningrad ZHURNAL OBSHCHEY KHIMII in Russian Vol 54, No 8, Aug 84 (manuscript received 27 Sep 83) pp 1749-1754

ROMANOV, G. V., NAZMUTDINOV, R. Ya., RYZHIKOVA, T. Ya., GRYAZNOVA, T. V. and PUDOVIK, A. N., Institute of Organic and Physical Chemistry imeni A. Ye. Arbuzov, Kazan Branch, USSR Academy of Sciences

[Abstract] A study shows that complete esters of hypophosphorous acid react with azomethines to form an isomeric mixture of aminoalkylphosphonite and amidophosphite. Figure 1; references 12: 10 Russian, 2 Western.
[23-12765]

UDC 547.298.5:547.26/118

PHOSPHOROTROPIC TAUTOMERIC MIGRATIONS OF PHOSPHORANILINE GROUP IN PENTADE N=C-N=C-N

Leningrad ZHURNAL OBSHCHEY KHIMII in Russian Vol 54, No 8, Aug 84 (manuscript received 13 Jul 83) pp 1764-1767

NEGREBETSKIY, V. V., KAL'CHENKO, V. I., BALITSKAYA, O. V., KORNILOV, M. Yu. and MARKOVSKIY, L. N., All-Union Scientific Research Institute of Chemical Means of Plant Protection, Moscow; Institute of Organic Chemistry, UkSSR Academy of Sciences, Kiev; Kiev State University imeni T. G. Shevchenko

[Abstract] Phosphorotropic migrations have been observed to occur only in tri- and tetra-coordinated phosphorus atom groups. In the present work, the first example of intermolecular migration of a phosphoraniline group was found to take place as two consecutive 1,3-migrations in ambident pentade N=C-N=C-N 1-[methoxyphenyl-bis-(orthophenylenedioxa)phosphoranyl]amino-3-(4-methoxyphenyl)-iminoisoindolenine. The free energy of activation of the phosphorotropic migration is 16.9 kcal/mole. References 6 (Russian).
[23-12765]

UDC 546.881-386:543.422.27

STUDY OF COMPLEX FORMATION OF VANADIUM OXOTRICHLORIDE AND TETRACHLORIDE WITH ORGANOPHOSPHORUS COMPOUNDS BY EPR AND IR SPECTROSCOPY

Leningrad ZHURNAL OBSHCHEY KHIMII in Russian Vol 54, No 8, Aug 84
(manuscript received 8 Jun 83) pp 1768-1769

KOSHKINA, G. N., IL'YASOV, A. V. and IVANOVA, A. K., Kazan Chemico-Technological Institute imeni S. M. Kirov

[Abstract] A study employing EPR and IR spectroscopy was made of the reaction mechanism of vanadium tetrachloride with esters of phosphorous acid such as $P(OC_6H_5)_3$, $C_8H_{17}OP(OC_6H_5)_2$, $P(OC_8H_{17})_3$, and vanadium oxotrichloride with the compounds: $P(OC_2H_5)_3$, $C_8H_{17}OP(OC_6H_5)_2$, $P(OC_3H_7)_3$, $P(OC_4H_9)_3$, $P(OC_6H_5)_3$, $P(OC_8H_{17})_3$, $(C_6H_5)_2POC_2H_5$ and $P(C_6H_5)_3$ in toluene solution. Both VCl_4 and $VOCl_3$ form complexes with the above ligands in which a molecule of the ligand enters the inner sphere of the complex. The pentavalent vanadium in the oxotrichloride is reduced to the tetravalent form. Coordination of P(III) compounds to the central atom in the complex takes place through the phosphorus atom. References 6: 4 Russian, 2 Western.
[23-12765]

UDC 547.558.1

SYNTHESIS AND STUDY OF PHOSPHONIUM-CONTAINING CHALCONES

Leningrad ZHURNAL OBSHCHEY KHIMII in Russian Vol 54, No 8, Aug 84
(manuscript received 3 Jun 83) pp 1770-1774

SHEVCHUK, M. I., BUKACHUK, O. M. and KOSHMAN, D. A., Chernovtsy State University

[Abstract] Six alpha,beta-unsaturated phosphonium-containing chalcones were synthesized by crotonic condensation of p-formylphenyltriphenylphosphonium tribromide with acetophenone, p-bromo-, p-nitroacetophenone and methyl-alpha-naphthyl ketone. A previously unknown series of phosphonium-containing chalcones was prepared by crotonic condensation of p-acetylphenyltriphenyl-phosphonium bromide with benzaldehyde, p-bromo-, p-nitro- and p-dimethylamino-benzaldehyde. Several mono- and bisphosphonioarylhydrazones were prepared from the synthesized p-triphenylphosphonium bromide-p-bromo-phenylstyryl ketone and p,p'-bistriphenylphosphonium bromide styryl ketone. References 2 (Russian).
[23-12765]

UDC 547.241

PHOSPHORYLATION OF TRIAMIDOIMIDOPHOSPHATES

Leningrad ZHURNAL OBSHCHEY KHIMII in Russian Vol 54, No 8, Aug 84
(manuscript received 3 Aug 83) pp 1774-1782

MARCHENKO, A. P., KOYDAN, G. N., PINCHUK, A. M. and KIRSANOV, A. V., Institute of Organic Chemistry, UkSSR Academy of Sciences, Kiev

[Abstract] A study was made of the phosphorylation of triamidoimidophosphates with phosphorus trichloride and dialkylamidophosphorous acid dichloride. PH^+-phosphonium chlorides are formed by complete substitution of chlorine atoms in phosphorus trichloride or N,N-dimethylamidodichlorophosphite with triamidophosphazo groups. Dehydrochlorination of the phosphonium chlorides results in the formation of phosphorous acid triamide analogs containing three or two triamidophosphazo groups, respectively. Their basicity is higher than that of the triamidoimidophosphates. References 12: 7 Russian, 5 Western.
[23-12765]

UDC 541.632:547.241.122.31

BRUCINE IN ASYMMETRIC SYNTHESIS OF ESTERS OF DITHIOPHOSPHONOUS AND DITHIOPHOSPHONIC ACIDS

Leningrad ZHURNAL OBSHCHEY KHIMII in Russian Vol 54, No 8, Aug 84
(manuscript received 10 Jan 84) pp 1913-1914

DIMUKHAMETOV, M. N. and NURETDINOV, I. A., Institute of Organic and Physical Chemistry imeni A. Ye. Arbuzov, Kazan Branch, USSR Academy of Sciences

[Abstract] Optically active esters of dithiophosphonic acid may be prepared by reaction of O,S-dialkylalkylphosphonate with phosphorus pentasulfide. In the present work it was established that the natural alkaloid brucine can be used as an asymmetrizing agent to prepare esters of phosphorus thioacids. S-alkylalkylchlorophosphonite reacts with alcohols in the presence of brucine in chloroform to form optically-active O,S-dialkylphosphonites which may be converted to O,S-dialkylalkyldithiophosphonate by reaction with sulfur.
References 3 (Western).
[23-12765]

UDC 547.26'118

REACTIONS OF CYCLIC AND ACYCLIC DERIVATIVES OF PHOSPHOROUS ACID WITH 1-MORPHOLINO-2-METHYL-1-PROPENE

Leningrad ZHURNAL OBSHCHEY KHIMII in Russian Vol 54, No 8, Aug 84
(manuscript received 19 Jan 84) pp 1916-1917

OVCHINNIKOV, V. V., CHEREZOV, S. V., CHERKASOV, R. A. and PUDOVIK, A. N.,
Kazan State University imeni V. I. Ul'yanov-Lenin

[Abstract] Five-membered 2,3-butylenes, pinacones and six-membered neopentylphosphorous acids were found for the first time to react without catalyst with 1-morpholino-2-methyl-1-propene. The results show that non-catalytic addition of cyclophosphorous acids at the C=C bond of enamines is readily possible. The latter are apparently more nucleophilic than vinyl esters, thus making it possible to include acyclic compounds in hydrophosphorylation reactions.
References 5 (Russian).
[23-12765]

UDC 547.26'118

REDUCTION OF THIOESTERS OF TRIVALENT PHOSPHORUS ACIDS WITH LITHIUM ALUMINUM HYDRIDE UNDER CONDITIONS OF INTERPHASE CATALYSIS

Leningrad ZHURNAL OBSHCHEY KHIMII in Russian Vol 54, No 8, Aug 84
(manuscript received 14 Dec 83) pp 1917-1918

SINYASHIN, O. G., GORSHUNOV, I. Yu., BATYYEVA, E. S. and PUDOVIK, A. N.,
Institute of Organic and Physical Chemistry imeni A. Ye. Arbuzov, Kazan Branch,
USSR Academy of Sciences

[Abstract] The ethyl ester of ethylphenylthiophosphonous acid was reduced for the first time with lithium aluminum hydride in benzene at 80°C for 6 hours to form ethylphenylphosphine at 16% yield. The same reaction may be carried out in 3 hours at 78% yield in the presence of 5-6% dibenzo-18-crown-6 as catalyst. Crown esters have an analogous effect on the reduction of dithiophosphonous acid esters. Thus, S,S-diethylphenyldithiophosphonite may be reduced to phenylphosphine with lithium aluminum hydride in benzene at 50-60°C for 9 hours at 43% yield. Without the crown ester, no reaction takes place.
References 4 (Western).
[23-12765]

UDC 547.233.07

SYNTHESIS AND PESTICIDE ACTIVITY OF CERTAIN AMINODERIVATIVES OF TERPENOIDS

Minsk IZVESTIYA AKADEMII NAUK BSSR: SERIYA KHIMICHEKIKH NAUK in Russian No 4, Jul-Aug 84 (manuscript received 3 Feb 84) pp 89-91

BARDYSHEV, I. I., KOZLOV, N. G., SHAPOVALOV, A. A., GUSEVA, N. A. and SMIRNOVA, K. F., Institute of Physical-Organic Chemistry, Belorussian SSR Academy of Sciences; All-Union Scientific Research Institute of Chemical Means of Plant Protection, Moscow

[Abstract] A study was made of the pesticidal activity of newly synthesized nitrogen-containing terpenes. Secondary amines containing the terpene radical were synthesized by hydroamination, which is a very convenient method for producing nitrogen-containing compounds. The reaction was performed in a flow-through type installation in a current of hydrogen at 10 to 15 atm, 230-260°C, space velocity of initial mixture 0.2-0.3 hr^{-1} in the presence of a heterogeneous catalyst, 15% copper and 16% lithium hydroxide applied to gamma aluminum oxide. The insectoacaricidal activity, fungicidal activity, and fungicidal activity under greenhouse conditions, are listed in tables. References 6: 4 Russian, 2 Western.
[378-6508]

UDC 621.982.094:621.89.22

EFFECT OF POLYMER DOPES ON AEROSOL-FORMATION OF OILS

Moscow KHIMIYA I TEKHNOLOGIYA TOPLIV I MASEL in Russian No 9, Sep 84 pp 21-22

LAPSHIN, V. N., SHOR, G. I., IVANKINA, E. B. and LIKHTEROV, S. D., All-Union Scientific Research Institute, Petroleum Industry; Krasnodar Branch, All-Union Scientific Research Institute, Petroleum Industry

[Abstract] Influence of Soviet polyisobutylenes (PIV) on effectiveness of aerosol formation of commercial oil was described and discussed. Aerosols were produced by an oil aerosol generator with air pressure at the generator intake and oil aerosol pressure in the oil aerosol generator tank at 0.3 MPa and 0.04 MPa respectively. The mechanism of aerosol formation from commercial oils containing PIV was related to association of the polymer molecules which form molecular structures with molecular weight M and concentration C, which are optimal for aerosol formation. Results obtained were explained by the fact that, upon atomization of the oil and polymer additive, the presence of associates of macromolecules which are associated with the oil-solvent, affects disruption of flow. Figures 4; references 4: 3 Russian, 1 Western.
[8-2791]

UDC 620.193.91

THERMAL STABILITY AND PROTECTION OF CORROSION INHIBITORS FOR MOTOR OILS

Moscow KHIMIYA I TEKHNOLOGIYA TOPLIV I MASEL in Russian No 9, Sep 84 pp 24-25

ENGLIN, A. B., KOZHEKIN, A. V., TISHINA, Ye. A. and MAYKO, L. P.

[Abstract] Assessment of the effect of high temperatures on the effectiveness of protection of oil-soluble corrosion inhibitors for motor oils involving a study of commercial oil corrosion inhibitors Akor-1, KP and MSDA-1 and prospective inhibitors SIM, Alop and MKD, showed that all of these corrosion inhibitors except MSDA-1 retain their protective effectiveness at high temperatures. References 6 (Russian).
[8-2791]

UDC 665.534

PRODUCTS OF HYDROCRACKING OF VACUUM DISTILLATES AS BASES FOR MOTOR OILS

Moscow KHIMIYA I TEKHNOLOGIYA TOPLIV I MASEL in Russian No 9, Sep 84 pp 31-32

L'VOV, I. A., KONAKOVA, S. A., YESINA, N. Ye., and FILATOV, V. V., Ryazan Experimental Plant, All-Union Scientific Research Institute of Petroleum Production

[Abstract] Hydrocracking fractions 360-400°C, 360°C-k.k. and 400°C-k.k. of hydrogenates obtained by hydrocracking of vacuum distillates of Western Siberian oil by a zeolite-containing aluminum-nickel-molybdenum catalyst at 15 MPa were studied as based for motor oils. The base oils of hydrocracking (except the 360-400°C fraction) closely resembled mineral oil ACB-5 produced from Western Siberian oils, in fractional composition. Low-temperature viscosity of oil fractions 360-400°C and 360°C-k.k. was lower than that in AU oil while fraction 400°C-k.k. occupied an intermediate position between values of this indicator for oils AU and ACB-5. Fraction 360°C-k.k. had the best viscosity-temperature properties and fractional composition of all the oil fractions studied. References: 1 Russian (footnote)
[8-2791]

UDC 665.765.404.001.4(06)

LABORATORY ASSAY OF CORROSION AGGRESSIVENESS OF MOTOR OILS

Moscow KHIMIYA I TEKHNOLOGIYA TOPLIV I MASEL in Russian No 9, Sep 84 pp 37-38

MOROZOVA, I. A., AVED'YAN, S. V. and ZASAVITSKAYA, A. A., All-Union Scientific Research Institute of Petroleum Industry

[Abstract] Use of an ultra-sonic generator to remove loose film from a copper surface during determination of corrosion aggressiveness of materials was described and discussed. Comparison of results from the use of this method and use of the GR 176/64 method in laboratory tests of corrosion aggressiveness of M-16G c and MT-4z/8D oils showed that removal of corrosion products from the surface of copper plates improves correlation of results of laboratory tests and test-stand studies. References 2 (Russian).
[8-2791]

UDC 661.7:547.268.1

SYNTHESIS OF HIGHER NORMAL 2-ALKANOLS

Moscow KHIMICHESKAYA PROMYSHLENNOST' in Russian No 9, Sep 84 pp 523-526

STEPANOVA, G. A., MARKEVICH, V. S., VINOGRADOV, M. G. and NIKISHIN, G. I.

[Abstract] Formation of methylalkyl ketones occurs most selectively with C_9 and higher olefines because the competing telomerization reactions decrease with increased molecular weight of the olefine. Complete conversion can be achieved with olefines in the boiling range 180-240°C, yielding 96-98% methylethyl ketones and acetic acid as a byproduct. The optimal conditions for converting the ketones into olefines are: pressure--10-11 MPa, temperature--180-190°C, the rate of crude material passage--0.3 l per liter of the catalyst per hour, and that of the hydrogen--300 l per liter of the crude per hour. Linear alcohols with α- and β-hydroxyl groups in respect to the terminal methyl group yield anion-active, non-ionogenic surfactants. In this respect, 2-alkanols with a fixed hydroxyl group have a distinct advantage over other secondary alcohols. Sodium sulfates of 2-alkanols were shown to have comparable overall effectiveness as surfactants, when compared to the standard sodium lauryl sulfates. Figures 2; references 8 (Russian).
[16-7813]

BOOK: POLYMER MIXTURES

Moscow SMESI POLIMEROV (NOVOYE V ZHIZNI, NAUKE , TEKHNIKE: SERIYA KHIMIYA) in Russian No 8, Aug 84 (signed to press 21 Aug 84) pp 2, 62-63

[Annotation, synopsis, conclusion and table of contents from book by Valeriy Nikolayevich Kuleznev, doctor of chemical sciences, "Polymer Mixtures", Izdatel'stvo "Znaniye", 26,720 copies, 64 pages]

[Text] Annotation

Polymer mixtures or melts are being used more and more widely to produce polymeric construction materials. In the overwhelming majority, structurally the mixtures are dispersions of one polymer in the medium of another. The colloidal-chemical structure of the mixtures determines their properties and fields of use. This brochure is devoted to this problem. It is intended for lecturers, instructors and attendees of peoples universities and readers interested in this topic.

Material Mixtures of Tomorrow

We have already said that three types of construction materials are known today--metal, ceramic and polymeric. The first two are very ancient, and mankind has used them all its conscious life and for a very long time has obtained these materials purposefully. Metal ores are always multicomponent, and pure metals are obtained from them complexly, and, therefore, the result was that man from the very beginning dealt with alloys. In time, people understood that the mechanical properties of alloys are better than pure metals and, therefore, pure metals are not used today as construction materials.

The age of polymers began much later than the bronze age. The beginning of the age of polymers is the beginning of their wide industrial synthesis, which developed chiefly after World War II. However, trends in the development of polymeric construction materials in general characteristics were analogous to the trends in the development of metal composites. In particular, this applies to the analogy of polymer mixtures and metal alloys. Indeed, polymer materials produced by industry already in volume now approximate the volume of metals, and toward the end of the century should be equal in weight to metals. The percentage of polymer mixtures of the total volume of use of polymer materials is constantly increasing, and this trend will predominate all the more. Already the variety of mixtures of polymer materials is not inferior to the variety of metal alloys.

The oldest branch of the polymer processing industry is the rubber processing-vulcanized rubber industry. And in this branch, the volume of use of mixtures of rubbers and mixtures of rubbers with plastics exceeds the corresponding indices in the field of plastics processing, primarily thermoplastics. The greatest volume of vulcanized rubber is used in motor vehicles. Thus, today all basic parts of tires except the breakers, and, also, inner tubes, are manufactured, as a rule, from rubber mixtures. This results from the fact that mixtures of polymers (including rubbers) possess a combination of properties which surpass the properties of the initial components, the obvious nonadditive nature of the properties, or, as they say, the synergism, appearing when the polymers are mixed.

The vulcanized rubber industry has always developed by leaning on successes in the field of mixing and compounding. It is impossible to use rubber not blending the ingredients, but it is possible to use plastics. This means that the technology of mixing in the field of plastics greatly lags behind the rubber industry, and it is impossible to transfer, blindly, the mixing technology from rubber to plastics. Therefore, the future processing of polymers in general is the development of a new mixing technology and the basic fulfillment of existing technology. This enables the large-tonnage polymer mixtures to be produced at plants for manufacturing polymers and small-tonnage polymer mixtures to be produced at plants for polymer processing. Such an approach in the near future will lead to the use of pure (not mixed and not filled) polymers as construction materials becoming an anachronism, the same as the situation is now with metals.

In the matter of obtaining mixed and, in general, composite materials, the technology of the manufacture of products from oligomers or monomers, and also powder technology, when products are obtained by molding powdered polymers, should play a large role. The possibilities of compounding here are indeed unlimited.

The outlook for the use of mixtures and melts of polymers depends on how rapidly the older art of mixing crosses over from an empirical basis to a scientific basis and how rapidly the great many specialists on polymer treatment master the science of mixing. It is hoped that this brochure would help this process.

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12410
CSO: 1841/6

UDC 541.64:542.954

FLUORINE-CONTAINING POLYARYLATES

Kiev DOKLADY AKADEMII NAUK UKRAINSKOY SSR, SERIYA B: GEOLOGICHESKIYE, KHIMICHESKIYE I BIOLOGICHESKIYE NAUKI in Russian No 8, Aug 84 (manuscript received 23 Mar 84) pp 42-45

KORSHAK, V. V., academician, KAMENEVA, T. M., MALICHENKO, B. F., SHELUD'KO, Ye. V., VASNEV, V. A., VINOGRADOVA, S. V., Department of Petrochemistry, Institute of Physico-organic Chemistry and Coal Chemistry, UkSSR Academy of Sciences, Kiev

[Abstract] Polyarylates were prepared using o,o'-, m,m'- and p,p'-biphenol with an included $-O-C_6F_4-O-$ group, and terephthalic, isophthalic, and diphenyloxide-p,p'-dicarboxylic acids. Comparisons were made with published data on similar polyarylates prepared with p,p'-biphenol having an inserted $C(CH_3)_2$ or $C(CF_3)_2$ group. Solubility of the isomeric polyarylates in a variety of organic solvents increased from para to meta to ortho, while the softening point decreased in the same direction. The decomposition temperature exceeded 400°C in most cases. The introduction of fluorine noticeably increased the hydrolytic stability of 40-micron films boiled in sulfuric acid and caustic soda solutions. References 7: 6 Russian, 1 Western. [4-12672]

UDC 541.64:536.7

THERMODYNAMICS OF POLYMER MELTS WITH FILLERS

Kiev DOKLADY AKADEMII NAUK UKRAINSKOY SSR, SERIYA B: GEOLOGICHESKIYE, KHIMICHESKIYE I BIOLOGICHESKIYE NAUKI in Russian No 8, Aug 84 (manuscript received 26 Apr 84) pp 48-51

LIPATOV, Yu. S., academician, UkSSR Academy of Sciences, SHIFRIN, V. V., BESKLUBENKO, Yu. D., DEMCHENKO, S. S., and PRIVALKO, V. P., Institute of Chemistry of High Molecular Weight Compounds, UkSSR Academy of Sciences, Kiev

[Abstract] Heat capacities and specific volumes of high-density polyethylene, polyurethane, and a 20/80 binary mixture were determined with and without a 40% addition of kaolin. Finely powdered mixtures were vacuum dried and repeatedly pressed at the melting point of the components. In the range 313-483°K, the heat capacity of the polyethylene showed one endothermal maximum

at 403°K; the polyurethane showed a relaxation in the range 383-423 K and a weaker anomoly at 463-483°K. The heat of fusion of the polyethylene, 179.6 kJ/kg, changed little with the addition of filler or polyurethane, indicating weak interaction. Observed increases in the "occupied volume"--the densest packing in a hypothetical amorphous structure--indicate a loosening of the molecular packing of polyetheylene at the surface boundary of the filler and in a transtion zone at the boundary with the polyurethane. This indicates that the filler increases interaction between the polymers and, hence, the thermodynamic stability of the system. Figures 2; references 10: 6 Russian, 4 Western.
[4-12672]

UDC 541.15:541.64

RADIATION-CHEMICAL POLYMERIZATION OF EPICHLOROPHYDRIN IN PRESENCE OF INITIATORS

Kiev TEORETICHESKAYA I EKSPERIMENTAL'NAYA KHIMIYA in Russian Vol 20, No 4, Jul-Aug 84 (manuscript received 9 Aug 83) pp 492-496

MELESHEVICH, A. P., KOZLOV, A. A. and DOROSHENKO, V. N., Institute of Physical Chemistry imeni L. V. Pisarzhevskiy, UkSSR Academy of Sciences, Kiev

[Abstract] Additives of various kinds, which are acceptors of radicals or charged particles and initiators of ionic polymerization were used for more precise explanation of the nature of active centers and for obtaining information concerning pathways of intensification of radiation polymerization of epichlorohydrin at 294 K. Introduction of diethylamine and pyridine into epichlorohydrin had practically no effect on the polymer yield but reduced its molecular mass, especially after introduction of pyridine. Only ferrocene and onium salts affected the polymer noticeably. The polymer yield increased 3-fold in the presence of ferrocene and 7-fold in the presence of borofluoride diphenyliodonium in comparison with pure monomer. The combined presence of ferrocene and onium salts on radiation polymerization of epichlorohydrin produced no initiating effect. The yield of polymer in this case was 4-fold lower than the yield produced by the additive effect of these additives. Figures 2; references 11: 9 Russian, 2 Western.
[5-2791]

UDC 541.15:66.095.25.678.744

SOME CHARACTERISTICS OF POLYMERIZATION OF AMINOALKYLMETHACRYLATES

Tashkent UZBEKSKIY KHIMICHESKIY ZHURNAL in Russian No 4, Jul-Aug 84 (manuscript received 23 Sep 82) pp 37-39

TOPCHIYEV, D. A., RUZIYEV, R. and DZHALILOV, A. T., Tashkent Order of Peoples Friendship Polytechnic Institute imeni Abu Raykhan Beruni; Institute of Petrochemical Synthesis imeni A. V. Topchiyev, USSR Academy of Sciences

[Abstract] Spontaneous polymerization was observed in a system of N,N-dimethylaminoethylmethacrylate (DMAEM) and N,N-diethylaminoethylmethacrylate (DEAEM) with alkyl halide, accompanied by quaternization of the amine monomer (The Menshutkin reaction). A detailed kinetic investigation of the initial stage of the quaternization reaction was carried out and showed that its rate constant did not change. Further work showed that the spontaneous polymerization occurred only in presence of both Menshutkin reaction reagents: DMAEM and C_2H_5Br as well as the monomeric DMAEM·C_2H_5Br quaternary salt. The process appeared to be nonradical. References 3 (Russian).
[12-7813]

UDC 547.35'362.365+546.33+678.044

ANIONIC POLYMERIZATION OF VINYL ACRYLATE

Ivanovo IZVESTIYA VYSSHIKH UCHEBNYKH ZAVEDENIY: KHIMIYA I KHIMICHESKAYA TEKHNOLOGIYA in Russian Vol 27, No 8, Aug 84 (manuscript received 20 Jul 82) pp 961-964

POKROVSKAYA, Ye. M., KOMAROV, N. V., KLOCHKOVA, T. V. and PUSHKAREVA, K. S., Chair of Organic Chemistry, Kuban State University

[Abstract] Anionic polymerization of vinyl acrylate was investigated under conditions in which the acrylate was reacted with acetylenide suspended in either dimethylformamide or hexamethylphosphotriamide. Reaction of vinyl acrylate with acetylenide in the aprotonic p-donors resulted in the formation of polyvinyl acrylate, with maximum yields obtained at -20°C. Chemical analysis and EPR spectroscopy confirmed the formation of polyvinyl acrylate. Heating of polyvinyl acrylate in methanol/benzene mixture with p-toluenesulfonic acid as catalyst led to alcoholysis of the polymer and formation of polymethacrylate and acetaldehyde. Figures 1; references 10: 8 Russian, 2 Western.
[17-12172]

UDC 547.435+547.582.2

SYNTHESIS OF DIASTEREOMERIC 3-METHYL-4-N-DIETHYLAMINO-2-BUTYL ESTERS OF para-ISOBUTOXYBENZOIC ACID

Yerevan ARMYANSKIY KHIMICHESKIY ZHURNAL in Russian Vol 37, No 7, Jul 84 (manuscript received 6 Jul 83) pp 461-463

MINASYAN, S. A., NAZARYAN, V. M., BADOYEVA, A. F., ALEKSANYAN, R. A. and MARKARYAN, E. A., Institute of Precision Organic Chemistry imeni A. L. Mndzhoyan, ArSSR Academy of Sciences, Yerevan

[Abstract] Hydrochlorides of a diastereomeric mixture of 3-methyl-4-N-diethylamino-2-butyl ether of para-isobutoxybenzoic acid and of individual isomers (threo-form IIa and erythro-form IIb) were synthesized in order to study their effect of coronary blood circulation. The aminoethers produced were defined by infra-red spectroscopy, paramagnetic resonance spectroscopy, mass spectroscopy and thin-layer chromatography. Pharmacological study of the hydrochlorides produced showed that hydrochloride II produces a 2-phase effect; a 1.5 mg/kg dose produces a 10-minute reduction of coronary circulation by 35±2.8 percent followed by a 55-60 minute increase of the volumetric rate of coronary blood flow. A 1.5 mg/kg dose of IIb under analogous experimental conditions produced an immediate 82±9.4 percent increase of volumetric rate of coronary blood flow which lasts for 3 or more hours while an equal dose of IIa reduced coronary circulation by 30±3.2 percent for 2 hours or longer. References 6: 5 Russian, 1 Western.
[36-2791]

UDC 541.64:678.7

SPONTANEOUS POLYMERIZATION OCCURRING DURING REACTION OF EPIBROMOHYDRINE WITH N,N'-DIPHENYLGUANIDINE

Tashkent UZBEKSKIY KHIMICHESKIY ZHURNAL in Russian No 4, Jul-Aug 84 (manuscript received 21 Mar 83) pp 34-37

SOIPOV, F. T., ISMAILOV, I. I. and DZHALILOV, A. T., Tashkent Order of Peoples Friendship Polytechnic Institute imeni Abu Raykhan Beruni

[Abstract] Spontaneous polymerization occurring in the reaction of epibromohydrine (EBH) with N,N'-diphenylguanidine (DPG) was studied in an attempt to obtain oligomers with stabilizing properties. The polymerization rate appeared to be a function of temperature, polarity of the reaction medium and the nature of the solvent used. The highest polymerization rate was observed in water with high dielectric permeability. Radical polymerization inhibitors showed no effect on the rate of polymerization. The reaction product obtained was used as a stabilizer of PVC; addition of 1% of this oligomer increased thermal stability of PVC. Figures 3; references 6: 4 Russian (1 by Western author), 2 Western.
[12-7813]

UDC 547.71.342+547.796

HARDENING OF EPOXY RESIN ED-20 EXPOSED TO ULTRA-VIOLET IRRADIATION

Yerevan ARMYANSKIY KHIMICHESKIY ZHURNAL in Russian Vol 37, No 7, Jul 84 (manuscript received 15 Mar 83) pp 463-465

YERITSYAN, M. L., SAFARYAN, E. P., YERITSYAN, N. P. and KARAPETYAN, K. A., State Scientific Research and Designing Institute of Polymer Glues imeni E. L. Ter-Gazaryan, Kirovakan, Armenian Pedagogical Institute imeni Kh. Abovyan, Yerevan

[Abstract] Ultraviolet irradiation (λ=350-400 nm) accelerated hardening of epoxy resin ED-20 by maleic anhydride [MA] or by a gelatin complex [Cu(DAITS)-Cl]$_2$ (structural formula given) due to photochemical activation of functional groups of the resin and the hardening agent. Use of a mixture of MA and [Cu(DAITS)Cl]$_2$ in a molar ratio of one produced a synergistic effect, producing the most rapid hardening by ultra-violet irradiation. A shift of absorption frequency of >C=O from 1720 cm^{-1}-1690 cm^{-1} revealed a mixture of the hardeners in infra-red spectra, indicating the formation of a new complex among components of the binary hardener, which is substantiated by a change of color from green to blue after mixing the hardeners, caused by the synergistic effect. In the absence of initiators of free-radical polymerization, allyl groups of the geletin complex were unchanged by ultraviolet rays. Figure 1; reference 1 (Russian).
[36-2791]

UDC 547.314.2:542.952.6+621.315.592

ORGANIC SEMICONDUCTORS AND METALS: PRODUCTION AND PROPERTIES OF POLYACETYLENE FILM

Yerevan ARMYANSKIY KHIMICHESKIY ZHURNAL in Russian Vol 37, No 7, Jul 84 (manuscript received 16 Apr 84) pp 465-466

MATNISHYAN, A. A. and KOBRYANSKIY, V. M., Armenian Branch of All-Union Scientific Research Institute "IREA", Yerevan

[Abstract] A simple method was developed of producing polyethylene films. The films were in free polyacetylene form or on a backing. The latter was made by spattering a specially-prepared polyacetylene suspension onto the backing or by application of the liquid phase with subsequent removal of the solvent. The rate of polymerization and the polymer yield were greatest at an optimum ration of the catalytic system of $NaBh_4$:$CO(NO_3)_2$~10. Polyacetylene of linear structure, predominantly of cis-configuration (~70 percent) was formed at 60-80° and the percent of trans-isomer increases with an increase of temperature. The molecular weight of the chlorinated polymer reached a value of 10^4-10^5. The film produced is dark red and blackens quickly in air and takes on a silver-metal hue upon drying. Alloying the polyacetylene films with donors or acceptors may produce semiconductor material of the p-type or r-type respectively. References: 5 Western.
[36-2791]

UDC 661.718.5.004.82:661.419

UTILIZATION OF HYDROGEN CHLORIDE IN PRODUCTION OF TETRAETHOXYSILANE

Moscow KHIMICHESKAYA PROMYSHLENNOST' in Russian No 9, Sep 84 pp 526-528

KRASNOV, B. P., GEZALOV, A. A., MUTALENKO, A. A., GORBUNOV, A. I., SEREGINA, A. I. and UFIMTSEV, N. G.

[Abstract] An attempt was made to develop production technology for tetraethoxysilane (TES) with direct production of HCl which could be then used in synthesis of chlorosilanes. Previous studies of the kinetics of the formation of ethyl chloride in the old system were not adequate for development of pure HCl production. This reaction process was studied altering the temperature (2-72°C) and the initial concentration of HCl in ethanol (0.109-5.0 mole/l). The data showed that the process should be carried out below 23°C and the acidic alcohol should not remain in the standstill zones. The second condition was to separate the two HCl streams emanating from the stages of etherification and desorption. A technological schematic was developed in which the streams of the abgas HCl obtained in production of TES were separated and the main stream of HCl obtained during the etherification stage, after a simple purification could be used in the synthesis of chlorosilanes. Figures 4; references 6: 2 Russian, 4 Western.
[16-7813]

UDC 661.718.5.004.82:661.419

UTILIZATION OF HYDROGEN CHLORIDE IN PRODUCTION OF ORGANOCHLOROSILANES

Moscow KHIMICHESKAYA PROMYSHLENNOST' in Russian No 9, Sep 84 pp 528-529

ANDREYEV, V. I., MARINOVA, N. V., DERKACH, O. N., TUMANOV, V. Yu. and KOZLOVA, G. I.

[Abstract] The salinity of soil does not permit continuation of the standard method of neutralizing acid emissions with alkaline solutions. In order to utilize the abgas HCl and avoid formation of acid and salt effluents, gas purification methods were developed based on condensation of chloroorganic and chlorosilane compounds and isolation of HCl which could be directly used in the production process. Catalysts prepared from regenerated silicon and copper were used in synthesis of methyl chlorosilane. The results were adequately satisfactory to recommend this newly-developed method for the utilization of HCl in industrial application. Figures 2; references 3: 2 Russian (1 by Western author), 1 Western.
[16-7813]

UDC 546.26+678.643.42

SURFACE MODIFICATION OF PHOSPHOROCARBON FIBERS BY EPOXY OLIGOMERS

Minsk IZVESTIYA AKADEMII NAUK BSSR: SERIYA KHIMICHESKIKH NAUK in Russian No 4, Jul-Aug 84 (manuscript received 6 Jun 83) pp 34-40

YERMOLENKO, I. N. and DUBKOVA, V. I., Institute of General and Inorganic Chemistry, Belorussian SSR Academy of Sciences

[Abstract] A study is presented of the influence of surface treatment of phosphorocarbon fibers by epoxy oligomers on properties of the composites produced. Phosphorocarbons were produced by thermolysis of hydrate-cellulose fibers or moleskin fabric containing 6.25-11.45 mass percent phosphorus. Epoxy oligomers used were alicyclic diepoxides and triepoxide plus diane resin. It is found that joint heat-treatment of phosphorocarbon fibers with epoxy oligomers results in chemical interaction of the components and further conversion of the structural element-containing units of the carbon fiber. The phosphorocarbon fiber, after modification with oligomers, loses elasticity because the epoximide--penetrating into the surface microcavities, defects, and cracks, filling the free volume of the fabric base and hardening in it under the influence of the active fiber groups--is converted to a three-dimensional reticular polymer reinforced with the carbon fiber. A strip of carbon fabric modified by the oligomer is a rigid high strength microplastic and retains its ion exchange capacity with the proper ratio of phosphorocarbon fibers to oligomer. Figures 4, references: 12 Russian.
[378-6508]

UDC 678:66.094.38:547.567

PROTECTION OF SYNTHETIC AND BIOLOGICAL POLYMERS FROM DESTRUCTION WITH ORTHOBENZOQUINONE AMINODERIVATIVES

Minsk IZVESTIYA AKADEMII NAUK BSSR: SERIYA KHIMICHESKIKH NAUK in Russian No 4, Jul-Aug 84 (manuscript received 28 Jan 83) pp 101-106

MATUSEVICH, P. A., Scientific Research Institute of Physical Chemical Problems, Belorussian State University imeni V. I. Lenin

[Abstract] A description is presented of the use of a number of orthobenzoquinone aminoderivatives (OBQAD) synthesized for the first time as antioxidants in the protection of synthetic polymers from thermal oxidative destruction, and also as free radical process inhibitors in pharmacologic protection of organs and tissues of animals from hypoxic and ischemic damage under oxygen starvation conditions. The OBQAD tested inhibited processes of thermal oxidative destruction of polymers better than thermal destruction processes. The compounds studied when administered under ischemic conditions help to restore the DNA-protein bonds broken by oxygen starvation. The aminoderivatives of orthobenzoquinone synthesized are clearly antioxidant and capable of breaking the chain of oxidation of synthetic polymers and also of protecting biopolymers from destructive processes. The basis of the antihypoxic effect of OBQAD is the antioxidant mechanism. Figures 3; references: 11 Russian.
[378-6508]

UDC 678.675'126-278:66.067

INFLUENCE OF THICKNESS ON STRUCTURAL-FILTRATIONAL AND DEFORMATION-STRENGTH CHARACTERISTICS OF MICROPOROUS CAPRON MEMBRANES

Minsk IZVESTIYA AKADEMII NAUK BSSR: SERIYA KHIMICHESKIKH NAUK in Russian No 4, Jul-Aug 84 (manuscript received 6 Sep 83) pp 107-111

ARTAMONOV, V. A., KORSHUNOVA, T. A., KARPINCHIK, Ye. V. and SOLDATOV, V. S., Institute of Physical-Organic Chemistry, Belorussian SSR Academy of Sciences

[Abstract] This work was intended to determine the influence of thickness of capron membranes on their permeability, pore size, porosity and strength. The objects of the studies were specimens of microporous capron membranes formed by a wet method, 18% capron solution in an aqueous solution of acetic acid at room temperature. The results agree well with electron microscope studies of the upper and lower surfaces of the membranes. As thickness increases, the upper surface becomes less developed, structural elements become larger and spaces between structures (pores) become smaller, decreasing permeability. The dimensions of a specimen have a significant influence on deformation and strength properties as well. As thickness increases the strength, elasticity modulus and elongation at rupture decrease. Moistening of specimens also causes a decrease in strength and modulus of elasticity, while elongation at rupture increases. References 13: 12 Russian, 1 Western. [378-6508]

UDC 550.93:551.71

STUDY OF FRACTIONATION OF CALCIUM ISOTOPES IN K-Ca RADIOLOGICAL DETERMINATION OF AGE

Leningrad RADIOKHIMIYA in Russian Vol 26, No 4, Jul-Aug 84
(manuscript received 6 Apr 83) pp 494-500

KOSTOYANOV, A. I.

[Abstract] The method of vaporization and ionization of Ca samples for mass spectrometry affects the isotope ratios in the resultant ion stream. Ca samples were vaporized on a W ribbon and ionized on Re foil. Measured isotope ratios were standardized with an equation assuming that discriminatory effects are proportional to isotope mass. The logarithm of the Ca-40/Ca-44 isotope ratio showed a clear linear variation with the reciprocal of the temperature of ionization, apparently due to differential heats of vaporization of the different isotopic compounds. Determination of true isotope ratios in natural mineral samples was done using a published isotopic distillation model for mathematical treatment of measured values. This yielded a value of 45.94 for Ca-40/Ca-44 and 0.3075 for Ca-42/Ca-44. Figures 1; references 11: 3 Russian, 8 Western.
[22-12672]

UDC 546.641:542.61

YTTRIUM-90 GENERATOR WITH HIGH RADIONUCLIDE PURITY

Leningrad RADIOKHIMIYA in Russian Vol 26, No 4, Jul-Aug 84
(manuscript received 21 Dec 82; in revised form 21 Mar 83) pp 500-504

MALININ, A. B., KURCHATOVA, L. N., TRONOVA, I. N., BASYURA, N. A., GROMOVA, N. P., TIKHOMIROVA, Ye. A. and KURENKOV, N. V.

[Abstract] The title generator was developed to provide high purity Y-90 with minimal Sr-90 content for medical applications. A three-stage extraction-chromatographic system was used with a fill of inert fluoroplast-4 grains. These were coated with di-2-ethylhexylphosphoric acid which adsorbed Y-90 from a mixed solution with Sr-90 in 0.1 molar HCl. The Y-90 was subsequently washed from the column with 6 molar HCl, evaporated, re-dissolved in 0.1 molar HCl and the process repeated for the second and third columns. Trace amounts of Sr-85 were added to the solutions to simplify analysis of low levels of Sr-90. The overall process required 5-6 hours. The Sr-90 levels in the final solutions were approximately 0.02 ppb, well within specifications for medical use. Figure 1; references 21: 11 Russian, 10 Western.
[22-12672]

UDC 546.15:628.388

RESULTS OF DETERMINATION OF IODINE-129 IN HEAT TRANSFER MEDIUM AND WASTES OF POWER REACTOR

Leningrad RADIOKHIMIYA in Russian Vol 26, No 4, Jul-Aug 84
(manuscript received 18 Aug 83) pp 572-575

KUZNETSOV, Yu. V., ROSYANOV, S. P. and VINOGRADOVA, V. K.

[Abstract] Normal iodide and sodium hypochlorite were added to liquid samples which were then extracted with carbon tetrachloride and a solution of hydroxylamine hydrochloride. The organic fraction was washed and extracted with sulfuric acid and the iodine precipitated as palladium iodide which was sealed in a glass vial and subjected to neutron irradiation. The ampule was then broken in a solution of potassium iodide and bromide, treated with sodium hypochlorite and extracted with carbon tetrachloride, nitric acid and hydroxylamine hydrochloride solution. After further purification, the iodine was then adsorbed on an AB-17 nitrated resin and measured with a gamma spectroscope. Iodine-129 levels in heat transfer medium averaged about 1.8×10^{-9} g/l; in waste solutions, it reached as high as 1.0×10^{-6} g/l. This is below allowable concentrations in open water; consequently iodine-129 is not a critical isotope for nuclear waste disposal. References 12: 8 Russian, 4 Western.
[22-12672]

UDC 621.039.3+542.61:546.97

EXTRACTION GENERATOR FOR RHODIUM-103M AND RHODIUM-106

Leningrad RADIOKHIMIYA in Russian Vol 26, No 4, Jul-Aug 84
(manuscript received 19 Sep 83; in revised form 28 Feb 84) pp 575-577

BAN CHUN SE and IOFA, B. Z.

[Abstract] A universal extraction generator for rhodium isotopes derived from corresponding ruthenium isotopes was based on extraction chromatography using carbon tetrachloride to extract isotopes from a solution of ceric sulphate and sodium hypochlorite. Natural ruthenium powder was subjected to neutron irradiation and then a two-stage extraction, using compressed air to move extractant solutions between stages and into a final collector vessel for Rh-103m product, giving a 95% yield with 99.93% purity. A commercial Ru-106 product was the starting point for production of Rh-106, but the short half-life required much faster operations. Nevertheless, a product of comparable purity was obtained. Figures 1; references 5: 2 Russian, 3 Western.
[22-12672]

UDC 539.19

QUASIRELATIVISTIC STUDY OF ELECTRON STRUCTURE OF URANIUM TETRAFLUORIDE

Kiev TEORETICHESKAYA I EKSPERIMENTAL'NAYA KHIMIYA in Russian Vol 20, No 4, Jul-Aug 84 (manuscript received 26 Mar 83) pp 406-415

TOPOL', I. A. and ZHILINSKIY, B. I., Moscow State University

[Abstract] Conclusions concerning the role of relativistic effects in the electron structure of molecules were based on comparison of results of calculation of the electron structure of UF_4, carried out in non-relativistic and quasi-relativistic approximations of the X alpha-PB method. Findings were: registration of relativistic effects changed the spatial distribution of the charge in the molecule which could change the interpretation of the connection in terms of the relationship of ionic to covalent components; relativistic scattering of wave functions of s, p electrons and delocalization of d, f-functions changed orbital energies and corresponding ionization potentials in heavy molecules and primary and secondary relativistic effects caused significant change of energies of electron excitation. Use of UF_4 as an example showed the inadequacy of use of non-relativistic wave functions for calculating spin-orbital splitting in heavy molecules. References 16: 8 Russian, 8 Western.
[5-2791]

UDC 614.7:628.543.142.002.237

GAS EVAPORATORS FOR THERMAL CONCENTRATION OF MINERALIZED EFFLUENTS

Moscow KHIMICHESKAYA PROMYSHLENNOST' in Russian No 9, Sep 84 pp 561-562

BUKHARKIN, Ye. N.

[Abstract] Thermal purification of mineralized effluents should be carried out in two stages: first, concentration of the solution and, then, final dehydration with separation of the dry residue. In order to determine optimal conditions for maximum evaporation of the effluent in multiple unit evaporators (MUE), two systems were evaluated: a common one with evaporation scrubber used as the second stage of evaporation and a cascade evaporator. The degree of preliminary concentration (W_1) was varied from 2.3 to 6.9. The results showed that with W_1 greater than 2.5-3, the MUE's with the scrubber were more economical and simple, showing also better technical indices in comparison to the cascade MUE. Figures 4; references 2 (Russian).
[16-7813]

UDC 628.543.354

ADDITIONAL TREATMENT OF EFFLUENTS ON AERATED FILTERS

Moscow KHIMICHESKAYA PROMYSHLENNOST' in Russian No 9, Sep 84 pp 531-532

KIRICHENKO, A. G., KOLESNIK, Ye. P., LAVRINENKO, K. I. and PAVLOVA, V. G.

[Abstract] An additional treatment was proposed for water purification based on passage of compressed air or oxygen into the filter zone of biochemically purified effluent which increased removal of dissolved and colloidal impurities. This additional step made it possible to lower KhPK [chemical oxygen demand?] by 17-29%, BPK [biochemical oxygen demand] by 53-66% and the concentration of suspended materials by 66-75%. The concentration of oxygen dissolved in this "superpurified" effluent increased to 6.5 mg/ml. The vertical filtration rate of this step was about 7-10 m/hr. The filter could be regenerated by reverse water-air flushing. Thus purified effluent, after the required sterilization process, could be recycled into the production channel. Figure 1; references 2 (Russian).
[16-7813]

UDC 630*863:628.543

NEW REAGENT FOR PRELIMINARY PURIFICATION OF EFFLUENTS

Moscow GIDROLIZNAYA I LESOKHIMICHESKAYA PROMYSHLENNOST' in Russian No 6, 1984 pp 8-9

MEL'NIK, N. A., director of Zaporozhye Yeast Hydrolysis Plant

[Abstract] Existing flaws in purification methods employed at the Zaporozhye yeast hydrolysis plant were eliminated in 1982 by addition of another stage of purification. This stage precedes biological purification by the use of air tanks and utilizes liquid wastes of sanitary scrubbers used in titanio-magnesium production. These wastes make up a suspension containing 15-40 g/l of calcium hydroxide, 10-20 g/l of calcium carbonate, 50-80 g/l of calcium chloride, 50-75 g/l of calcium hypochlorite and 5-10 g/l of calcium chlorate. Use of these liquid wastes reduced the degree of contamination of highly contaminated effluents and purified effluents of the Zaporozhye plant up to 98.5 percent of standard figures. Use of this procedure by other plants with their own purification systems as well as by plants dumping effluents into the municipal sewage system was recommended. Regulations for using these titanio-magnesium scrubber wastes are being developed in collaboration with the effluents purification laboratory of the All-Union Scientific Research Institute of Hydrolysis. Figure 1.
[39-2791]

UTILIZATION OF THERMALLY STABLE POLYMER PIPES IN SANITATION-TECHNICAL SYSTEMS

Moscow VODOSNABZHENIYE I SANITARNAYA TEKHNIKA in Russian No 9, Sep 84 pp 28-29

VERSTOV, V. V., candidate of technical sciences, DODUSENKO, V. V., engineer, CHISTOVICH, S. A., doctor of technical sciences and SHKALIKOV, G. S., candidate of technical sciences, All-Union Scientific Research Institute of Municipal Sanitation

[Abstract] The authors presented some advantages of plastic pipes over the standard metal pipes, as described in foreign literature: American and Finnish. The effect of temperature and pressure on the longevity of pipes was discussed along with design and methods of installation of this system. The data obtained so far shows a definite trend towards the replacement of metallic pipes with plastic ones in the water supply and heating networks. Figures 4; references 3: 1 Russian, 2 Western.
[26-7813]

UDC 628.387

USE OF EFFLUENTS AFTER ADDITIONAL PURIFICATION IN TECHNICAL WATER SUPPLY FOR THERMAL ENERGY PLANT

Moscow VODOSNABZHENIYE I SANITARNAYA TEKHNIKA in Russian No 9, Sep 84 pp 20-21

STORONSKIY, V. I., candidate of technical sciences and FERENDOVICH, B. V., engineer; Lvov Polytechnical Institute

[Abstract] It was shown to be possible in principle to use biologically purified effluents of a large city, after additional purification, in resupplying a water supply system for thermal electric plants. These findings should be verified by State Sanitary Epidemiological Stations before full scale application. Conversion from drinking water to water recovered from effluents would save 432,000 m^3 of water per day in a city like Lvov, along with lowering the environmental contamination from impure effluents. Economical savings in Lvov alone would reach 370,000 rubles per year.
References 4 (Russian).
[26-7813]

UDC 630*86:628.543.12

METROLOGICAL ASSESSMENT OF METHODS OF ANALYZING EFFLUENTS

Moscow GIDROLIZNAYA I LESOKHIMICHESKAYA PROMYSHLENNOST' in Russian No 6, 1984 pp 20-21

KUPTSOVA, Z. K., FILIMONOVA, V. A., LAUGINA, O. I., ZIL'BERBRAND, G. Ye. and KANYSHEVA, A. M., Central Scientific Research and Planning Institute of Wood-Chemistry Industry

[Abstract] Samples of purified and unpurified effluents were studied at the Central Scientific Research and Planning Institute of the Wood-Chemistry Industry in order to find metrological characteristics for methods of analyzing effluents from wood-chemistry enterprises. Proceeding from maximum contamination of effluents, intervals of concentrations of a specific component was selected and metrological characteristics of methods of analysis for these intervals were studied. Data derived were tabulated with the table containing lists of pollutants in the effluents, the method of analysis used, the literature source, changes in methods of analysis, and indicators of metrological assessment of the methods. References 7 (Russian).
[39-2791]

UDC 541.18

INTENSIFICATION OF COAGULATION PROCESSES FOR PURIFICATION OF EFFLUENT WITH WATER SOLUBLE POLYELECTROLYTE KO-3

Tashkent UZBEKSKIY KHIMICHESKIY ZHURNAL in Russian No 4, Jul-Aug 84 (manuscript received 20 Sep 83) pp 28-30

KHABIBULLINA, N. A., SATAYEV, I. K., SHIN, L. D. and AKHMEDOV, K. S., Tashkent Order of Peoples Friendship Polytechnic Institute imeni Abu Raykhan Beruni; Institute of Chemistry, UzSSR Academy of Sciences

[Abstract] The effect of a new polyelectrolyte KO-3 and electrolyte coagulators on the degree of clarification of naturally-opaque effluents and on industrial acidic effluents containing arsenic was investigated. KO-3 was obtained from acrylic acid nitrile by suspension polymerization followed by saponification in aqueous alcohol medium. The industrially-used CaO did not yield satisfactory results. The purification of effluent depended on its pH, on the temperature and the duration of KO-3 treatment. It was shown that addition of even 0.02% of KO-3 accelerated precipitation of the dispersed phase. The best effect was achieved at pH 1-3. The process was further accelerated by addition of $Al_2(SO_4)_3$ to the suspension. Figure 1; references 6 (Russian).
[12-7813]

UDC 630*863:547.724.1.002

PRODUCTION OF FURFURAL BY TWO-PHASE HYDROLYSIS OF DECIDUOUS WOOD PULP WITH USE OF MONOCALCIUM PHOSPHATE

Moscow GIDROLIZNAYA I LESOKHIMICHESKAYA PROMYSHLENNOST' in Russian No 6, 1984 pp 26-28

KOLOMEYETS, V. I., SAMSONOV, P. I., Manturova Biochemical Plant, SHKUT, V. M., MOROZOV, Ye. F., KEBICH, M. S. and SHISHAKOV, Ye. P., Belorussian Technologic Institute imeni S. M. Kirov

[Abstract] Continuation of study of a process of 2-phase hydrolysis of wood pulp on an experimental-industrial scale with the use of monocalcium phosphate as a catalyst was described and discussed. Hydrolysates of 2-phase cookings with the use of monocalcium phosphate equalled commercial samples in biological quality. Results obtained justified the transfer of the Manturov plant furfural department of the hydrolysis shop to operation under the new technology in April 1983. The mean yield of furfural from a cooking was 700 kg of condensate or 600 kg of commercial product which exceeds the furfural yield (350 kg) obtained by the previously-used, single-phase hydrolysis technology. The increase of furfural yield and the complex conversion of deciduous wood pulp improved technical and economic indicators of production, reduced raw material expenditure, saved energy and thus reduced production costs. The economic impact from introduction of the 2-phase procedure exceeded 600,000 rubles per annum. Figures 3; references 6 (Russian).
[39-2791]

UDC 630*863.5:663.14.039.3

MICROFLORA OF BIOOXIDATION APPARATUS OF HYDROLYSIS PLANTS

Moscow GIDROLIZNAYA I LESOKHIMICHESKAYA PROMYSHLENNOST' in Russian No 6, 1984 pp 9-11

SEMUSHINA, T. N., head of laboratories, GUSAROVA, L. A., senior scientific associate, AKURA, V. D., senior engineer and MORALEVA, T. Yu., engineer, "Gidrolizprom" Scientific Production Association

[Abstract] Study of the composition of microflora of biooxidation apparatus of 14 hydrolysis plants showed that the microflora composition of different stages of biooxidation is very diverse. As a rule, yeast microorganisms

developed, basically, at the 1st stage of biooxidation while fungi of the genus Trichosporon predominate at the 2d stage, with the presence of a lesser quantity of saprophytic fungi and bacteria. Data concerning the composition of microflora of the biooxidation unit of the Bobruysk plant and data concerning biooxidation of the fermenting mixture at the Leningrad hydrolysis plant are presented in tables. Maximum percent of reduction of the degree of contamination of effluents did not exceed 48 percent because the organic substances remaining in the fermenting mixture are not split by the enzymic system of the group of microorganisms used. References 4 (Russian).
[39-2791]

UDC 630*863:628.312

STUDY AND IDENTIFICATION OF MICROORGANISMS ISOLATED FROM BIOOXIDIZERS OF LOCAL PURIFICATION INSTALLATIONS OF BOBRUYSK HYDROLYSIS PLANT

Moscow GIDROLIZNAYA I LESOKHIMICHESKAYA PROMYSHLENNOST' in Russian No 6, 1984 pp 6-8

IDEL'CHIK, M. S., senior scientific associate, CHERNYAYEVA, L. I., junior scientific associate, BSSR Academy of Sciences Institute of Microbiology, and ZININA, M. A., senior engineer of a Bobruysk Hydrolysis Plant Scientific Research Group

[Abstract] Study of morphological and physiological-biochemical properties of yeast cultures and bacterial cultures by methods described earlier and identification (by methods described earlier) showed the isolated yeast cultures to be representatives of genera Trichosporan and Candida, which can grow at temperatures up to 45 C. All of the bacterial cultures isolated and identified are gram-negative asporogenic rods with various degrees of aerobicity. They included 4 genera: Klebsiella, Flavobacterium, Alcaligenes and Arthrobacterium. Yeasts predominated (54-61 percent) at the 1st stage of biooxidation while bacteria (69-79 percent) predominated at the 2d stage. Bacteria most frequently isolated from the effluents at the 1st stage of purification belong to the genus Klebsiella and their numbers decreased with reduction of impurities in the effluents. Slow-growing bacteria isolated from the effluents represented the genera Flavobacterium, Alcaligenes and Arthrobacterium. References 9: 4 Russian, 5 Western.
[39-2791]

UDC 541.139+541.132.3

BEHAVIOR OF pH OF SOLUTIONS OF SOME ELECTROLYTES EXPOSED TO ROTATING MAGNETIC FIELD

Yerevan ARMYANSKIY KHIMICHESKIY ZHURNAL in Russian Vol 37, No 7, Jul 84 (manuscript received 24 Apr 83) pp 466-469

KHAZHAKYAN, L. V., BOKHOSYAN, L. Z. and KHACHATURYAN, S. K., Institute of Fine Organic Chemistry imeni A. L. Mndzhoyan, ArSSR Academy of Sciences, Yerevan

[Abstract] Experimental study of the effect of a rotating magnetic field on the pH of electrolytes HCl, H_2SO_4, CH_3COOH, $NaHCO_3$, K_2CrO_4, $Na_2S_2O_3$, KSCN, KCl, NH_4Cl and buffer solutions with pH 4.00, 6.88, 9.22 at 20° was performed with the use of devices which can determine change of pH directly in a rotating magnetic field. The pH of a solution increased under the effect of a magnetic field, reaching a maximum value. Disappearance of effects of a magnetic field, reaching a maximum value. Disappearance of effects of a magnetic field in some seasons, as reported in other studies, was not detected. The pH of buffer solutions and concentrated (>0.001N) solutions was unaffected by a rotating magnetic field while the pH of diluted (≤0.001N) acid and alkaline solutions tended to be about 7. New glass electrodes affected the pH upon magnetization of solutions more than electrodes used for more than 6 months did. Study of the effect of field intensity and rate of rotation of a magnetic field showed that a powerful magnetic field produced an insignificant change of pH (5-10 percent). Deviation of pH value of up to 1.25 units occurred at high rates of rotation of the magnetic field. Figures 2; references 11: 9 Russian, 2 Western.
[36-2791]

CSO: 1841

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